United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R04-86/018
September 1986

EPA

Superfund Record of Decision:

Sapp Battery, FL

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA/ROD/R04-86/018	2.	3. RECIPIENT'S ACCESSION NO
4. TITLE AND SUBTITLE SUPERFUND RECORD OF DECISION Sapp Battery, FL		5. REPORT DATE September 26, 1986
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT NO
		11. CONTRACT/GRANT NO
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460		13. TYPE OF REPORT AND PERIOD COVERED Final ROD Report
		14. SPONSORING AGENCY CODE 800/00

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Sapp Battery site occupies an area of approximately 45 acres in a rural part of Jackson County, Florida. Located on the site are two ponds, connected by a small channel. In 1970, Sapp Battery Service, Inc. began an operation to recover lead from used batteries. The process consisted of breaking open used batteries, dumping the acid outside the plant, recovering the lead, and disposing of the broken battery casings in an onsite man-made fishing pond. In 1977 the acid discharge began killing nearby cypress trees. Sapp Battery subsequently undertook several steps to alleviate the problem, all of which failed. In 1980, Mr. Jerry Sapp, owner of Sapp Battery, closed operations and, in effect, walked away from the site. The RI/FS conducted at the site revealed soils, sediments, surface water and ground water contaminated with lead, cadmium, arsenic, antimony and other heavy metals.

The selected remedial action for this site includes: excavation of soils and sediments containing contaminant levels above those set in the Risk Assessment; fixation of the excavated soils/sediments and onsite disposal of the solidified matrix into a cell built to Florida Class I sanitary Landfill Standards; groundwater removal and treatment of the underlying aquifers; treatment and discharge of contaminated surface water from the onsite swamp and the offsite Steele City Bay area; and monitoring program for potable water wells located within a one-mile radius of the site. Needed

(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field Group
Record of Decision Sapp Battery, FL Contaminated Media: soil, sw, gw, sediments Key contaminants: lead, cadmium, heavy metals		

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EPA/ROD/R04-86/018
Sapp Battery, FL

16. ABSTRACT (continued)

insitutional controls will be assessed and implemented during the Remedial Design/Remedial Action (RD/RA) phase of the project. Estimated capital cost of the selected remedy is $14,318,544 with annual O&M costs of $25,631.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

MEMORANDUM

DATE: SEP 26 1986

SUBJECT: Record of Decision for the Sapp Battery NPL CERCLA Site, Jackson County, Florida

FROM: Chief, Remedial Action Section

TO: Jack E. Ravan, Regional Administrator

THRU: Richard D. Stonebraker, Acting Chief
Emergency & Remedial Response Branch

Patrick M. Tobin, Director
Waste Management Division

The attached Record of Decision (ROD), when signed by you, will constitute the Agency's official selection of a permanent remedy for the Sapp Battery site. The recommended alternative includes:

- Excavation and solidification of soils/sediments which contain contaminant levels higher than those set in the Risk Assessment.

- Depositing solidified material into an onsite disposal cell built to Florida Class I Sanitary Landfill Standards.

- Removal and treatment of contaminated groundwater in aquifers underlying the site.

- Long term operation and maintanence will include:

    - maintenance of onsite disposal cell
    - monitoring of potable water wells within a one-mile radius of the site.

There are several complete routes of exposure, such as dermal contact, ingestion of contaminated groundwater and possibly soils. Selection and implementation of this remedy will permanently restore the groundwater and would remove exposure pathways.

The State of Florida has concurred with the proposed remedy and has agreed to provide funding for 10% of the Remedial Action which is estimated to have a present worth cost of $16,552,209.00.

I recommend that you approve this memorandum and the attached Record of Decision, thereby officially selecting this remedy for the Sapp Battery site.

Russell L. Wright, Chief
Remedial Action Section

9-24-86
DATE

CONCUR: R. D. Stonebraker

Richard D. Stonebraker, Acting Chief
Emergency & Remedial Response Branch

9/25/86
DATE

CONCUR: Patrick M Tobin

Patrick M. Tobin, Director
Waste Management Division

9-26-86
DATE

Attachment

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

SITE

Sapp Battery Site
Jackson County, Florida

DOCUMENTS REVIEWED

I am basing my decision primarily on the following documents describing site specific conditions and the analysis of effectiveness and cost of the remedial alternatives at the Sapp Battery site:

- Remedial Investigation Report, FDER, January 1984;
- Initial Remedial Measures Program, Soil Sampling and Analyses, ESE, June 1984
- Summary Report, Ecology & Environment, July 1986;
- Feasibility Study Report, Ecology & Environment, August 1986.

DESCRIPTION OF THE SELECTED REMEDY

- Excavation of soils and sediments containing contaminant levels above those set in the Risk Assessment.

- Fixation of the excavated soils/sediments and onsite disposal of the solidified matrix into a cell built to Florida Class I sanitary Landfill Standards.

- Groundwater removal and treatment of the underlying aquifers.

- Treatment and discharge of contaminated surface water from the onsite swamp and the offsite Steele City Bay area

- Needed institutional controls will be assessed and implemented during the Remedial Design/Remedial Action (RD/RA) phase of the project.

- A monitor program for potable water wells located within a one-mile radius of the site.

- Operation and Maintenance (O&M) activities will include:

    - groundwater monitoring.
    - maintenance of onsite disposal cell.

- A laboratory study will be performed by EPA's Environmental Response Team to assess the applicability of the soils washing technology at the site. Should the results be positive, consideration will be given to integrating the soils washing technology into the selected remedy. The laboratory study is expected to take approximately two months to complete and will be undertaken immediately upon the availibilty of funding.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the National Contingency Plan (40 CFR, Part 300), I have determined that the above described remedy for the Sapp Battery site is a cost effective remedy and provides adequate protection of the public health, welfare and the environment. The State of Florida has been consulted with and agrees with the approved remedy. The State has furthermore agreed to provide its 10% cost share for the remedial action and, at the appropriate time, to take over the maintenence of the onsite disposal cell and the post remedial action long term monitoring.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared for approval of that action.

SEP 26 1986

Date

Jack E. Ravan

Jack E. Ravan
Regional Administrator

SECTION I
SITE LOCATION AND DESCRIPTION

The Sapp Battery Site occupies an area of approximately 45 acres in a rural part of Jackson County, Florida. It is located approximately 5 miles south of the town of Cottondale and two miles north of the town of Alford; it is immediately north of Jackson County Road 280 and immediately west of the Atlanta and St. Andrews Bay Railroad tracks (see Figure 1). Currently, about 15 acres of the site are covered by two surface water bodies, which are connected by a small channel (see Figure 2). All that remains of the Sapp Battery Recycling Facility is the plant's concrete foundation. Surface water runoff is controlled by a series of berms around the southern and eastern boundaries of the most heavily contaminated area. There is also an approximately 5 acre area liner over the area directly south of the existing foundation; this liner covers the area that was excavated by the Florida Department of Environmental Regulation (FDER) during their Initial Remedial Measures (IRMs). On the northwest edge of the site, surface drainage is directed into the offsite swamp. Directly across County Road 280, is Steele City Bay which receives drainage from onsite surface water bodies. All of the above described features can be distinguished on Figures 1 and 2.

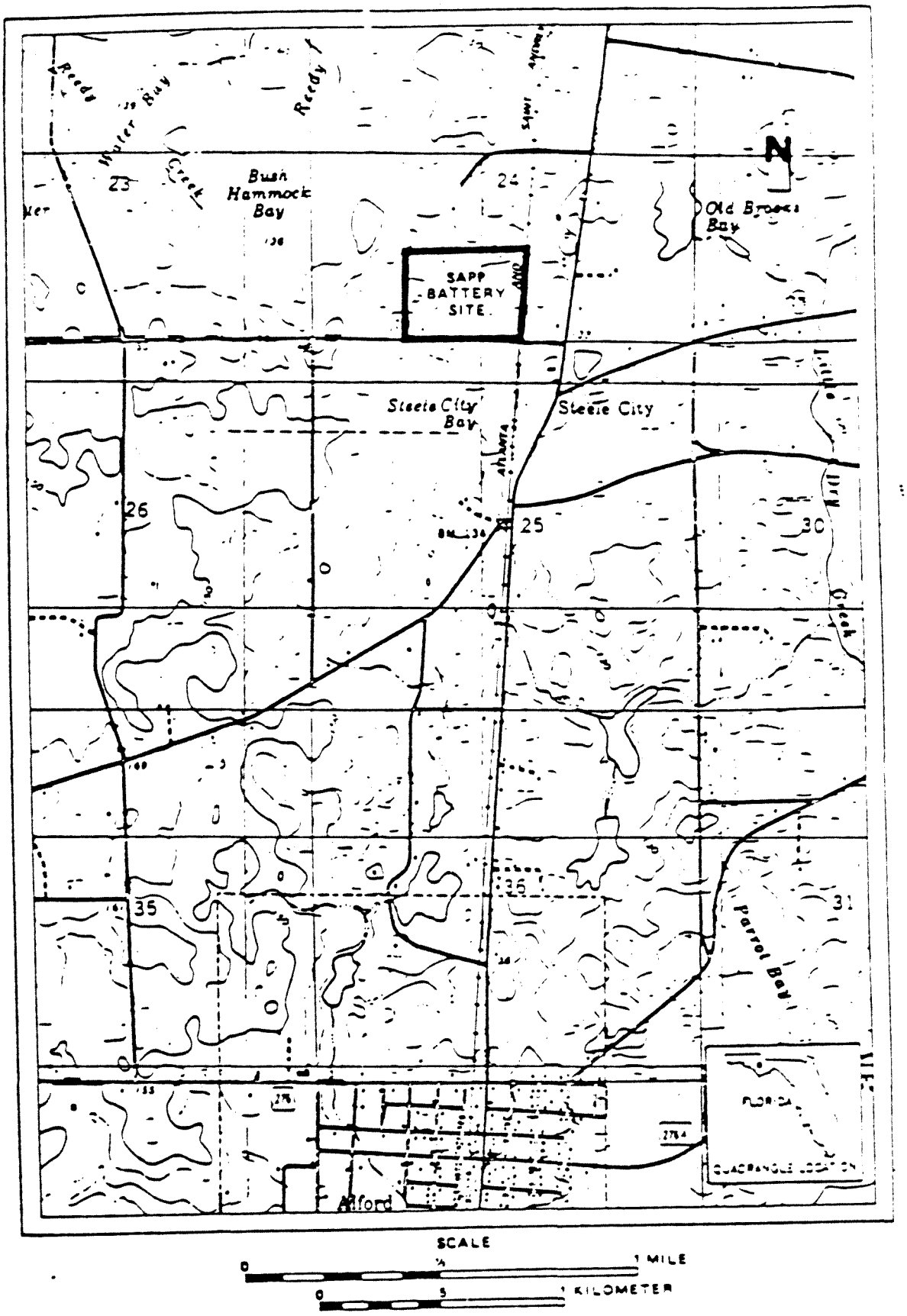

Reedy
Water Bay
Reedy
Creek
Bush
Hammock
Bay
23
24
N
Old Brooks
Bay
SAPP
BATTERY
SITE
Steele City
Bay
Steele City
26
25
30
35
36
31
Parrot Bay
Creek
Alford
FLORIDA
QUADRANGLE LOCATION
SCALE
0
1/2
1 MILE
0
.5
1 KILOMETER

FIGURE 1

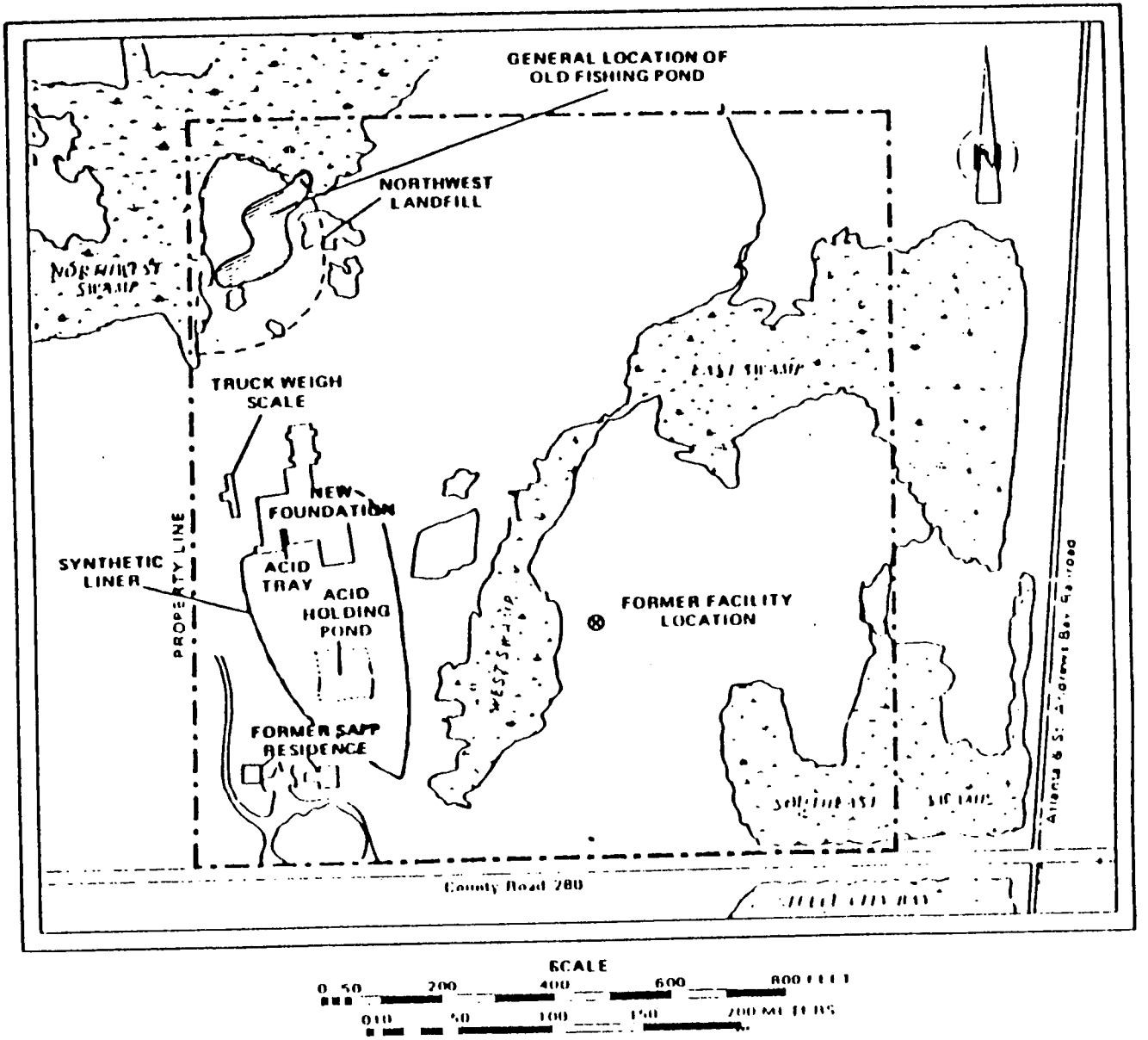

GENERAL LOCATION OF
OLD FISHING POND
NORTHWEST
LANDFILL
TRUCK WEIGH
SCALE
NEW
FOUNDATION
SYNTHETIC
LINER
ACID
TRAY
ACID
HOLDING
POND
PROPERTY LINE
FORMER SAPP
RESIDENCE
FORMER FACILITY
LOCATION
County Road 280
SCALE
0 50 200 400 600 800 FEET
0 10 50 100 150 200 METERS

FIGURE 2

SECTION II
SITE AND REGULATORY HISTORY

Sapp Battery Service, Inc. initiated their operation of cracking open used automobile batteries to recover lead in the year 1970. Beginning as a small operation, the business at its peak employed 35 personnel, occupied 14,000 square feet of plant (of which now only the foundation remains) and processed about 50,000 used batteries a week. Standard Operating Procedure for dealing with the wastes was to dump the acid from the batteries outside the plant; where it ran southeast into the west swamp, which drains into the East and Southeast Swamps, and eventually under CR-280 into Steele City Bay. The broken battery casings were primarily disposed of in a man-made fishing pond that was north of the plant and alongside the boundaries of the West Swamp; however, there is a profusion of battery casing chips distributed over most of the site.

By 1977, the acid discharge from the plant had started to kill the cypress trees in Steele City Bay and beyond. The FDER received its first complaints about the situation in the spring of 1978. In response to enforcement actions by FDER, the Sapp Battery management undertook several steps to alleviate the problem. The more significant measures included: 1) digging the large Holding Pond for the acid wastewater directly south of the plant; 2) using the fill excavated from the pond, constructing a berm south of the West Swamp; and 3) dredging a channel to connect the West and East Swamps. Subsequent inspections by FDER confirmed that these measures had failed to remediate the problem and FDER followed with a series of legal actions. In January of 1980, Mr. Jerry Sapp, the owner of the Sapp Battery Salvage Company, abruptly closed down the business and, in effect, walked away from the site.

In response to citizen concern about high acidity and lead concentrations in Steele City Bay, the United States Environmental Protection Agency (EPA) undertook emergency cleanup actions under its Clean Water Act Section 311 provisions. The actions undertaken were: 1) the existing berm was built up and extended to the east; 2) an additional berm was constructed north of the plant area; 3) the chipped battery casings between the Holding Pond and the West Swamp were bulldozed into a pile; 4) one ton of hydrated lime was disked into the soil; 5) two trenches, one south of the West Swamp and one between the Holding Pond and the West Swamp, were dug and filled with lime; and 6) a lime slurry was sprayed into the Holding Pond, the West Swamp and the CR-280 culvert. However, pH values returned to their previous low values within a short while.

In 1980, in an effort to combat the problem of remediating abandoned hazardous waste dumps, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Sapp Battery Site was proposed for inclusion on the National Priorities List (NPL) in October 1981 and included on the final NPL when it was published in August 1982. In September 1982, FDER negotiated a Cooperative Agreement Grant

to implement a Remedial Investigation and Feasibility Study (RI/FS) at the site. The original grant size was $235,000.00; this was supplemented in 1983 with an additional $50,000.00.

FDER chose to conduct the RI portion of the project internally. The field work was accomplished in the spring of 1983. The field work included a comprehensive sampling program of the shallow soil, the battery casing disposal areas, both onsite and offsite surface water and sediment, and groundwater. The results of these sampling activities are given in detail in the Final Report - Sapp Battery Site - Remedial Investigation, FDER, January 20, 1984. In general, the results indicated that onsite soils, surface water, sediments and groundwater were heavily contaminated with several heavy metals; most notably lead.

Concurrently with the RI, EPA had tasked its REM contractor, NUS to conduct a very limited sampling expedition and produce a focused Feasibility Study. However, when the draft document was received, it was agreed by both EPA and FDER that there was not enough hard data available to support implementing a remedial action. Consequently, the draft document was never finalized and this effort was terminated.

In December of 1983, FDER contracted with an outside consultant, Environmental Science & Engineering (ESE), to conduct the FS. As the first task of the FS, ESE was to produce a document assessing the need to implement any Initial Remedial Measures (IRMs) and what form these proposed IRMs would take. ESE submitted several proposed IRMs to FDER in January 1984. FDER in turn identified additional IRMs that FDER felt would be needed and, in February 1984, submitted a request to EPA to fund the state identified IRMs using Superfund monies.

Although EPA was not opposed to implementing IRMs at the Sapp Battery Site, EPA disagreed with the extent of the proposed IRMs that FDER requested. As a result, EPA informed FDER by letter in March 1984 that the Agency would be able to fund some, but not all, of the IRMs that FDER had proposed. FDER rejected the EPA offer and instead implemented their selected IRMs using the State of Florida's Water Quality Trust Fund. The federally funded RI/FS was put on hold.

FDER completed the following IRMs in mid-1984: 1) erecting a 6 feet high fence around three of the 4 sides of the site (the northern side was left unfenced because it borders a marshy area); 2) draining of the holding pond and the onsite treatment of 176,445 gallons of contaminated water from that pond; 3) excavation and removal of 9195 cubic yards of contaminated sludge/soil, mostly in the area of the holding pond; 4) construction of a berm and a weir to control stormwater runoff; 5) backfilling the holding pond area with clean fill from the northern part of the property. An attempt was made during 1984 to separate and recycle the pile of chipped battery casings and debris but due to operational problems, the recycling process proved non-cost-effective and the majority of the chip pile was disposed of offsite. A temporary cap was installed over the excavated areas in early 1985.

Having stabilized the site, FDER renewed its FS efforts. Because the original RI effort had not completely delineated the extent of the contamination, EPA and FDER agreed that an additional more extensive sampling effort was needed to support a decision on remedial action. To accomplish that goal, an additional $394,000.00 was allocated to the Cooperative Agreement grant. This took place in May 1985.

During the early part of 1985, FDER declined to renew the contract with ESE and instead selected Ecology and Environment, Inc. (E&E) to be their new FS consultant. A scope of work for the additional sampling tasks was agreed upon and the additional field studies were accomplished in the latter part of 1985. The two reports resulting from this effort, the Summary Report for the Field Investigation at the Sapp Battery Site, E&E February 28, 1986, and the Feasibility Study Report for the Sapp Battery Salvage Site, E&E February 1986, were submitted at the end of February 1986.

The first draft of the Feasibility Study required extensive work before it could be used to select a site-specific remedy. The revised FS Report was submitted to the Agency on August 15, 1986.

SECTION III
CURRENT SITE STATUS

SITE GEOLOGY

In general, there are three aquifer systems in the vicinity of the Sapp Battery Site: the confined Floridan aquifer system, the overlying semi-confined intermediate aquifer system, and the shallow, unconfined surficial aquifer system. In addition, possibly two or three more localized semi-confined hydrostratigraphic units occur within the intermediate deposits.

The shallow surficial aquifer system in this area of Jackson County lies within Pliocene-age sands and clays and Holocene- to Pleistocene-age undifferentiated marine, fluvial, and terrace materials. In general, this aquifer system is present to a depth of 10 to 30 feet below land surface, and is confined below by the upper impermeable clayey layers of the intermediate aquifer system. This aquifer is in direct communication with the surrounding cypress swamps; hence, water levels are commonly very near or at land surface in low-lying areas.

The semi-confined intermediate aquifer system lies within the Pliocene- and Miocene-age clays, sandy clays, and clayey sand sequences, which exhibit great variability with respect to texture and continuity. This aquifer system ranges in thickness from 30 to greater than 100 feet. The great variability of the intermediate aquifer reflects the undulating surface of the underlying limestone as well as the presence of filled-in sinkholes. The major potentiometric surface within the intermediate aquifer slopes to the south-southwest in the western portion of the site and to the west in the eastern portion of the site.

The Floridan aquifer is thought to be 400 to 600 feet thick. It has a gentle easterly flow; with a hydraulic gradient of less than 0.01%. The additional field work confirmed the conclusion that several sinkholes breach the Floridan aquifer system at the site.

BATTERY INVESTIGATION

In the RI. one of the major tasks was to determine the extent of the buried battery casings. The results indicated that there are approximately 23,000 cubic yards of buried battery casings.

SOILS INVESTIGATION

In the original RI, the site was divided into four areas for the purpose of soil sampling. A total of 31 soil samples were taken from eleven different depths at eleven different locations and analyzed for lead, cadmium, antimony, manganese, copper, nickel and aluminum. The results can be seen in Table 1.

TABLE 1

Metals Analysis - Shallow Soil Samples

Sapp Battery

Soil Sample I.D. #	Depth (feet)	Metals Concentration (mg/kg)						
		Pb	Cd	Sb	Mn	Cu	Ni	Al
AH-1-1	0 - 0.5	84,490	11.2	114	23	15	5.3	5,604
AH-1-2	2 - 2.5	14,120	0.3	<9	6.4	15	9	45,109
AH-1-3	5 - 5.5	3,714	<0.2	<11	7.7	18	7.1	56,971
AH-1-4	8.5 - 9	623	<0.2	<11	9.0	18	5.3	46,187
AH-2-1	0 - 0.5	46	<0.2	<9	5.9	7.7	5.2	29,507
AH-2-2	2 - 2.5	5.2	<0.2	<8	4.5	6.4	1.7	36,339
AH-2-3	5 - 5.5	8.6	<0.2	<11	9.0	17	5.5	55,266
AH-2-4	8.5 - 9	16.9	0.3	<16	112	20	14	91,625
AH-3-1	3 - 3.5	3,870	<0.2	<8	9.7	6.2	3.1	7,492
AH-3-2	6 - 6.5	356	<0.2	<11	2.5	3.4	4.3	29,353
AH-4-1	1 - 1.5	21,052	<0.2	<9	5.0	12	5.5	22,632
AH-4-2	5 - 5.5	1,682	0.5	<11	3.4	7.8	5.5	36,225
AH-4-3	9 - 9.5	464	<0.2	<11	3.9	6.1	7.3	33,161
AH-5-1	1 - 1.5	47	<0.2	<10	4.3	2.7	1.5	9,011
AH-5-2	5 - 5.5	1,646	<0.2	<9	4.4	5.7	2.7	31,977
AH-5-3	9 - 9.5	446	<0.3	<14	36	28	7.4	74,095
AH-6-1	3 - 3.5	7,881	<0.3	<13	185	5.5	3.3	11,697
AH-6-2	5 - 5.5	505	<0.2	<11	61	4.6	1.9	22,478
AH-6-3	8.5 - 9	197	<0.2	<9	8.4	4.3	3.3	19,274
AH-7-1	3 - 3.5	704	<0.2	<8	47	4.5	2.9	24,784
AH-7-2	5 - 5.5	174	<0.2	<9	7.7	8.1	4.0	37,936
AH-7-3	9 - 9.5	225	<0.2	<11	17	11	1.3	26,692

TABLE 1 (cont)

Metals Analysis - Shallow Soil Samples

Sapp Battery

Soil Sample I.D. #	Depth (feet)	Metals Concentration (mg/kg)						
		Pb	Cd	Sb	Mn	Cu	Ni	Al
AH-8-1	3 - 3.5	204	<0.2	<8	28	6.8	4.3	35,259
AH-8-2	5 - 5.5	92	<0.2	<9	12	5.3	3.3	34,929
AH-8-3	8 - 8.5	422	<0.2	<12	13	5.1	4.5	30,000
AH-9-1	4 - 4.5	77	<0.2	19	2.4	1.0	0.7	3,882
AH-10-1	2.5 - 3	331	<0.2	<8	7.2	3.3	4.5	21,084
AH-10-2	6 - 6.5	133	<0.2	<10	6.3	3.6	5.7	44,719
AH-11-1	0.5 - 1	10.4	<0.2	<10	322	4.0	5.0	20,534
AH-11-2	5 - 5.5	6.6	<0.2	<10	6.7	6.8	5.6	43,980
AH-11-3	9 - 9.5	10.5	<0.3	<16	8.6	5.4	5.5	51,053

Three of the soil samples underwent a modification of the EP Toxicity Test. The details of the testing procedure can be found in Chapter Five in the RI. The test results are in Table 2.

The results of the RI soil sampling documented extensive lead contamination. As a result of this, FDER decided to implement IRMs. To define the extent of their proposed soil cleanup, FDER implemented an additional soil sampling program. A grid was laid out, as shown in Figure 3, and approximately forty-two soil cores were taken and analyzed for total lead. The details of the sampling locations and the results of the analyses can be found in Table 3.

As can be seen by examining Figure 3, the sampling effort encompassed only the area of the site in and around the holding pond, roughly south of the plant foundation and west of the West Swamp. This was the area targeted by FDER's IRMS and, in fact, over 9000 cubic yards of this contaminated sludge/soil was removed and replaced with clean fill. Sampling in the immediate area of the holding pond was done before the fill was put in place and the remaining lead levels were residual. After the fill was in place, a synthetic liner was put over the area.

An extensive surface and subsurface soils investigation was undertaken during the Additional Field Investigation in 1985. Detailed information about the results of the latest study can be found in the E&E Summary Report. However, a general sense of the areal and vertical extent of the contamination can be had by examining Figures 4 through 8. These figures show the levels of lead that were found at each of the sampled depths.

In summary, gross lead contamination of the surface soils (0-0.5 feet) is generally restricted to the western half of the site. In contrast, gross lead contamination 0.5 and 10 feet below land surface is, for the most part, restricted to four areas: the Northwest Landfill, northeast of the plant foundation, between the West Swamp and the plastic liner, and south of the West Samp and plastic liner. The high lead concentrations in the first three of these areas appears to be correlated with the occurrence of greater thicknesses of battery chip fill; whereas lead contamination in the southernmost area is probably a result of its being located in a former surface drainage path.

SURFACE WATER AND SEDIMENT INVESTIGATION

For the Remedial Investigation, a total of twenty sampling stations were established: four onsite and the remaining sixteen in the drainage area of Steele City Bay and Little Dry Creek. At each station, a water and a sediment sample were taken. The exception is at Station 100 where only a sediment sample was taken.

The water samples were analyzed for a number of parameters. The specific results can be seen in Tables 4 and 5. In general, it is very evident

TABLE 2
EP Toxicity - Selected Shallow Soil Samples
Sapp Battery

Soil Sample I.D. #	Analytical Results mg/l					
	As	Ba	Cd	Cr	Pb	Se
AH-1-2	<0.005	<0.5	<0.05	<0.05	7.28	0.02
AH-4-2	<0.005	<0.5	<0.05	<0.05	0.23	<0.005
AH-6-1	<0.005	<0.5	<0.05	<0.05	11.31	<0.005

TABLE 3

SOIL SAMPLING ANALYTICAL RESULTS
LEAD (MG/KG-DRY)

STATION NUMBER	DEPTH TO SAMPLE (FT) 0.0	2.5	5.0	7.5	10
53	6820	1961	322	338	200
54	8330	834	500	11.9	36.3
55	3627	69.4	156	74.5	499
56	95000	27300	1130	15000	457
57	115000	22400	29700	11200	37.9
61	103000	53400	63100	681	255
64	6220	43.0	37.5	<32.6	<23.7
65	20600	3300	1440	1360	52.2
66	36000	14600	43100	46800	1330
71	79000	2040	41500	149	71.4
74	20700	134	<30.5	132	64.0
75	33300	123	<29.1	<30.0	<31.6
76	71500	67300	17500	20700	171
81	22500	252	<33.1	126	<32.2
84	4231	7100	<33.3	<35.4	<31.2
85	67300	1270	9440	6731	2120
91	17200	187	25.2	27.3	27.9
92	43.7	275	<33.4	<31.6	<36.4
93	3611	695	84.6	164	331
94	4980	3051	<33.0	<31.3	<32.4
95	9147	79.1	<32.5	34.4	<33.3

TABLE 3 (cont)

SOIL SAMPLING ANALYTICAL RESULTS
LEAD (MG/KG-DRY)

STATION NUMBER	DEPTH OF SAMPLE (FT) 0.0	3.5	5.0	7.5	11
13	10600	44.5	24.1	592	752
14	571	172	45.0	35.8	23.1
15	3347	79600	109	374	293
16	1010	64100	442	46.4	45.3
24	1590	4.9	49.2	25.1	11.5
25	26200	154	15.5	30.0	35.1
26	44900	1410	214	19.4	134
27	4610	7150	3210	4150	148
34	14000	575	947	63.3	59.3
35	27400	31.4	43.4	46.5	33.0
36	37700	15100	2520	315	50.2
40	10100	57.3	3910	141	96.9
41	127000	5130	1690	73.7	44.6
42	115300	493	470	95.7	125
43	73.1	95.2	15.0	27.1	33.6
44	20300	51.5	19.1	49.7	21.1
45	3920	621	322	77.6	124
46	141000	6950	52.3	100	37.5
50	137	121	125	<35.9	<35.7
51	110000	77300	341	147	277
52	195.1	3961	2740	1370	39.5

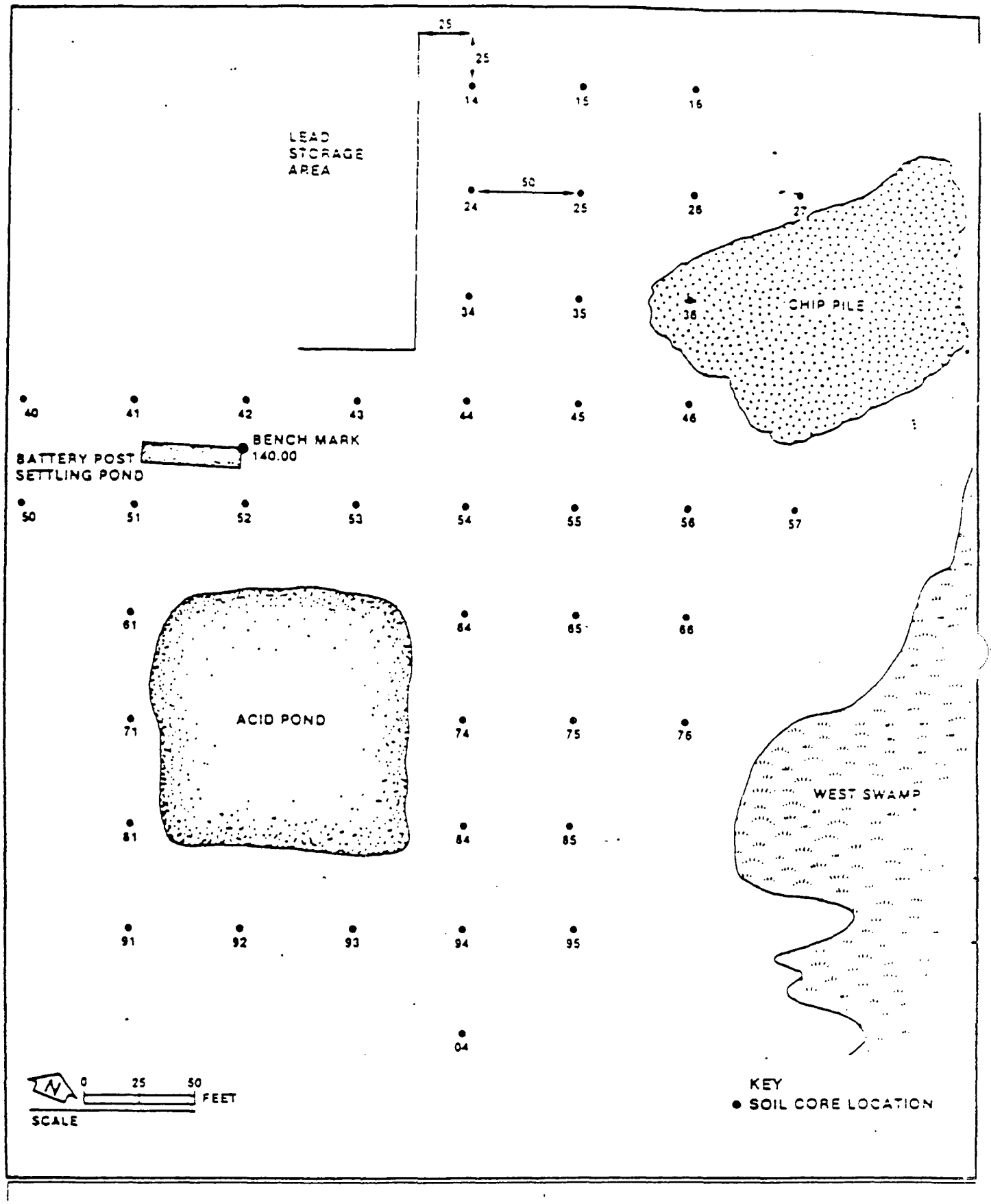
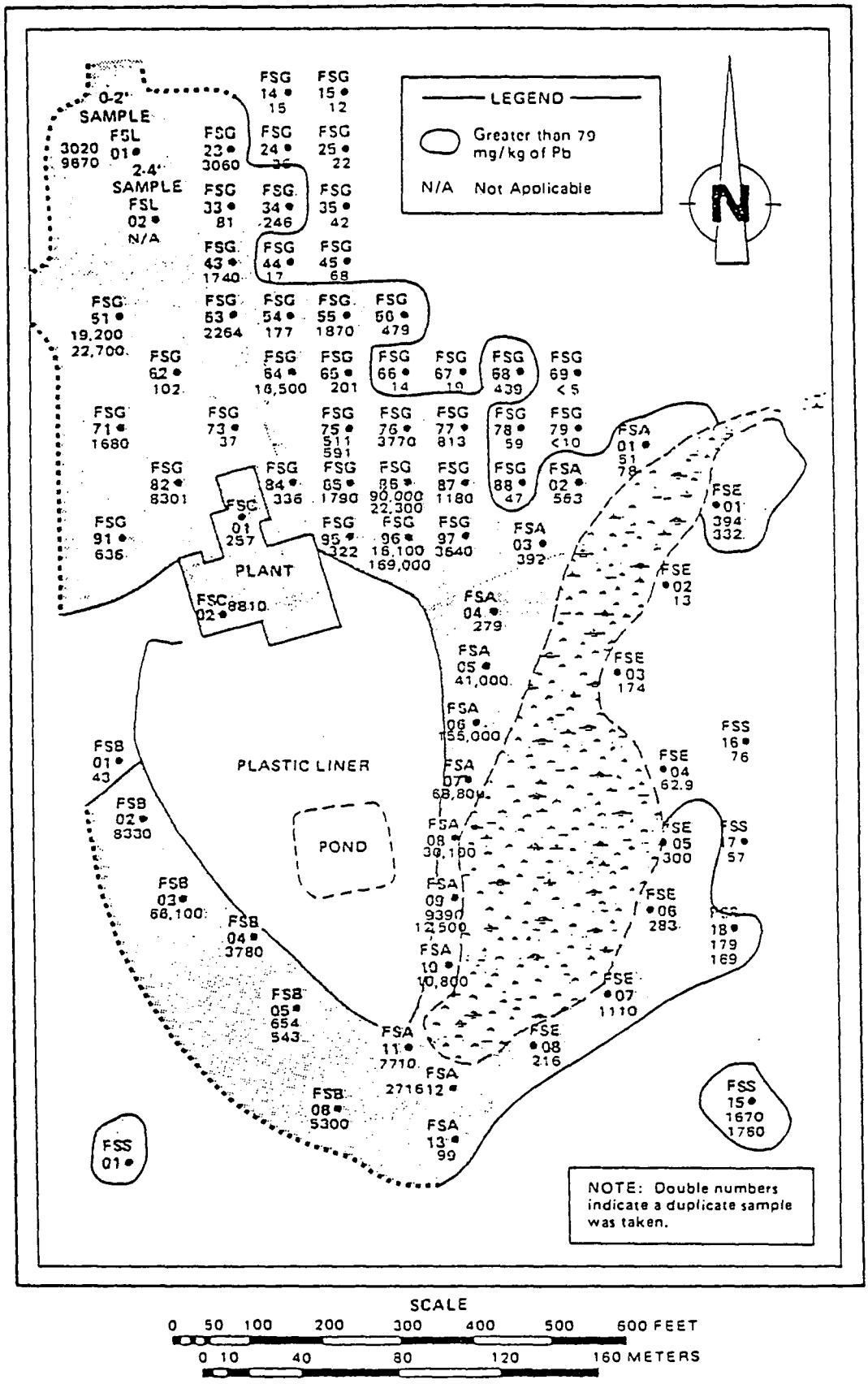


FIGURE 3

SAPP BATTERY
HAZARDOUS WASTE SITE



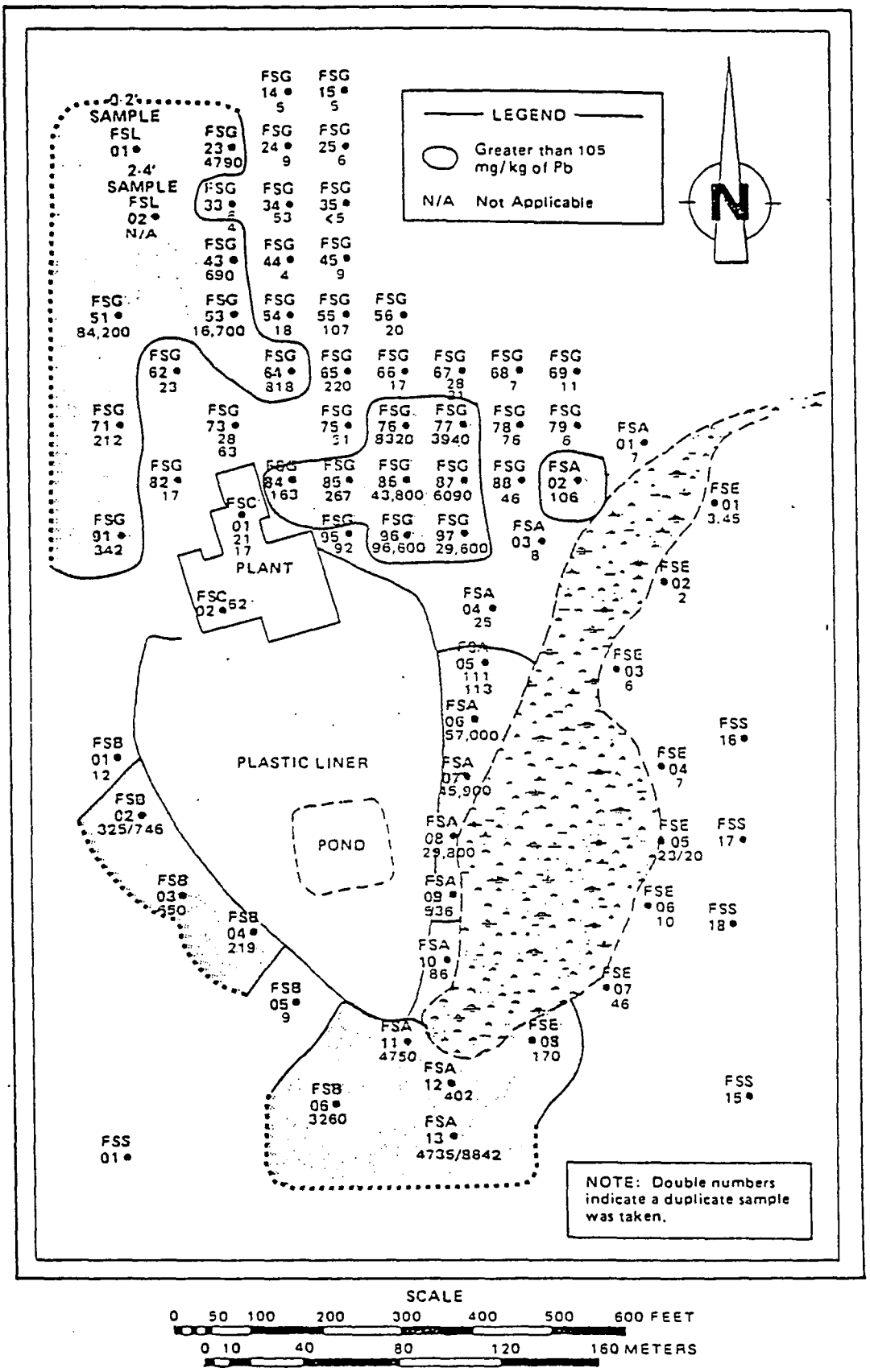
SCALE

0 50 100 200 300 400 500 600 FEET

0 10 40 80 120 160 METERS

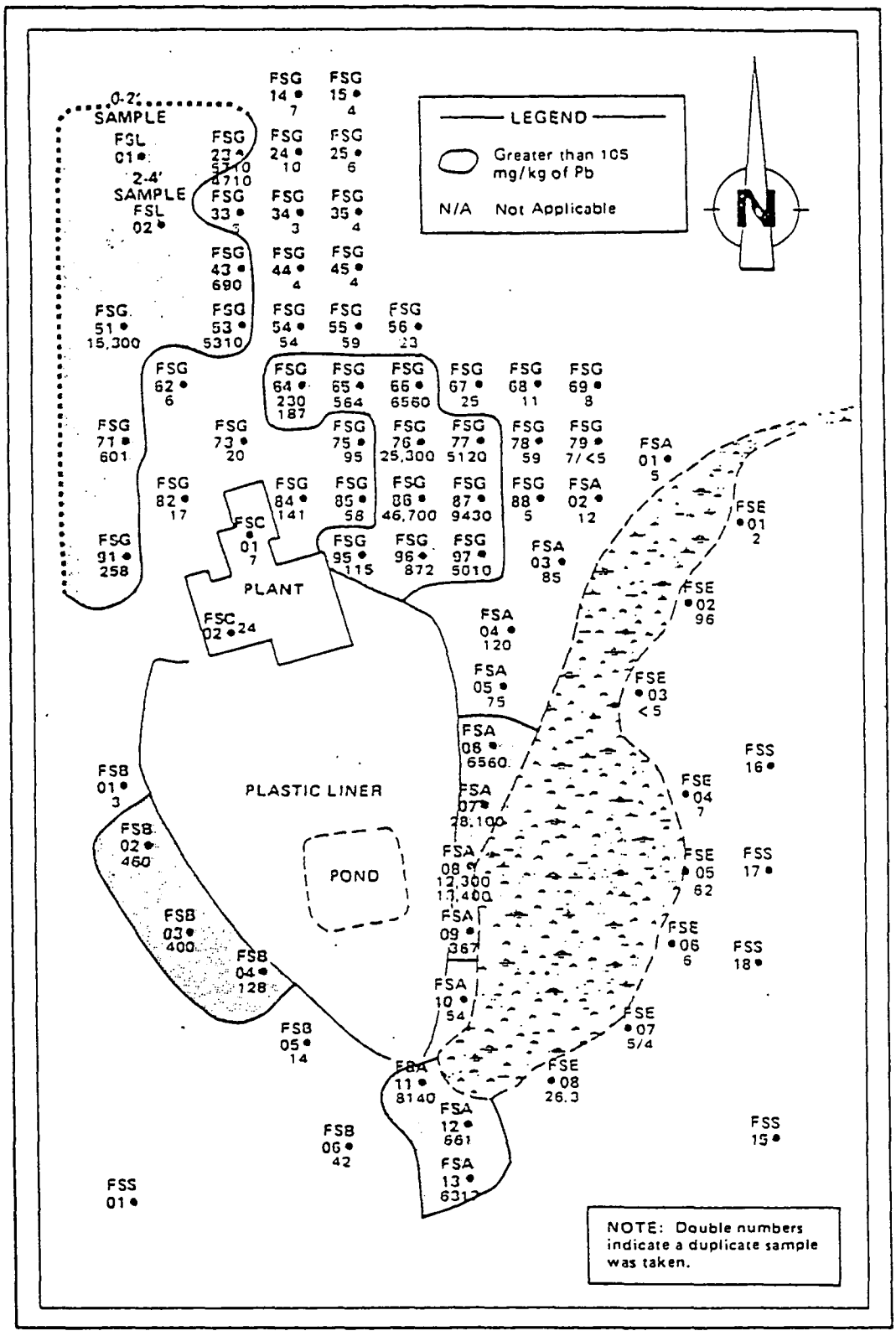
LEAD CONCENTRATIONS (mg/kg) IN THE A INTERVAL (0–0.5 Feet) SAMPLES OF ON–SITE SOIL BORINGS

FIGURE 4



LEAD CONCENTRATIONS (mg/kg) IN THE B INTERVAL (0.5–2.5 Feet) SAMPLES OF ON–SITE SOIL BORINGS

FIGURE 5



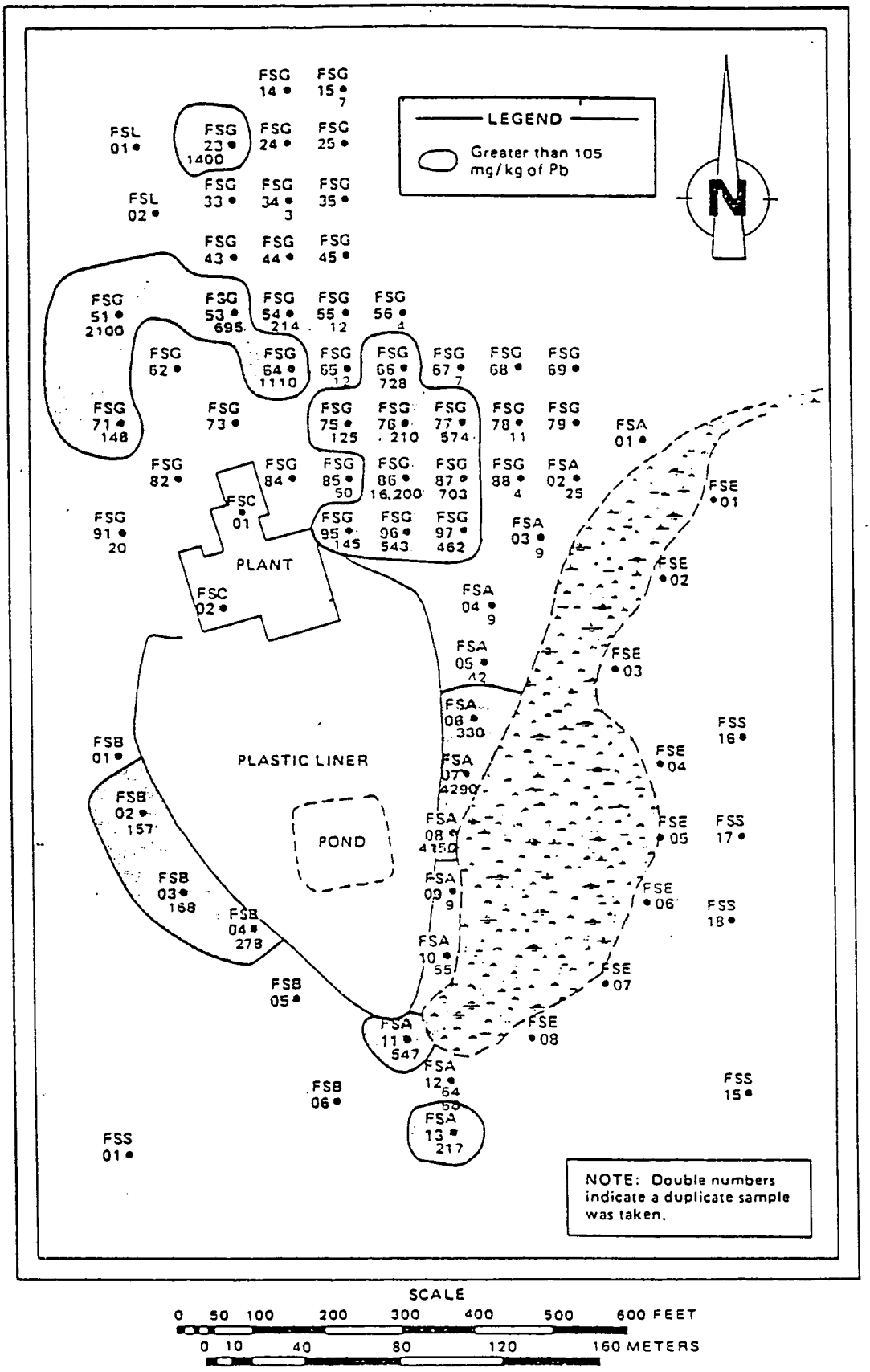
SCALE

0 50 100 200 300 400 500 600 FEET

0 10 40 80 120 160 METERS

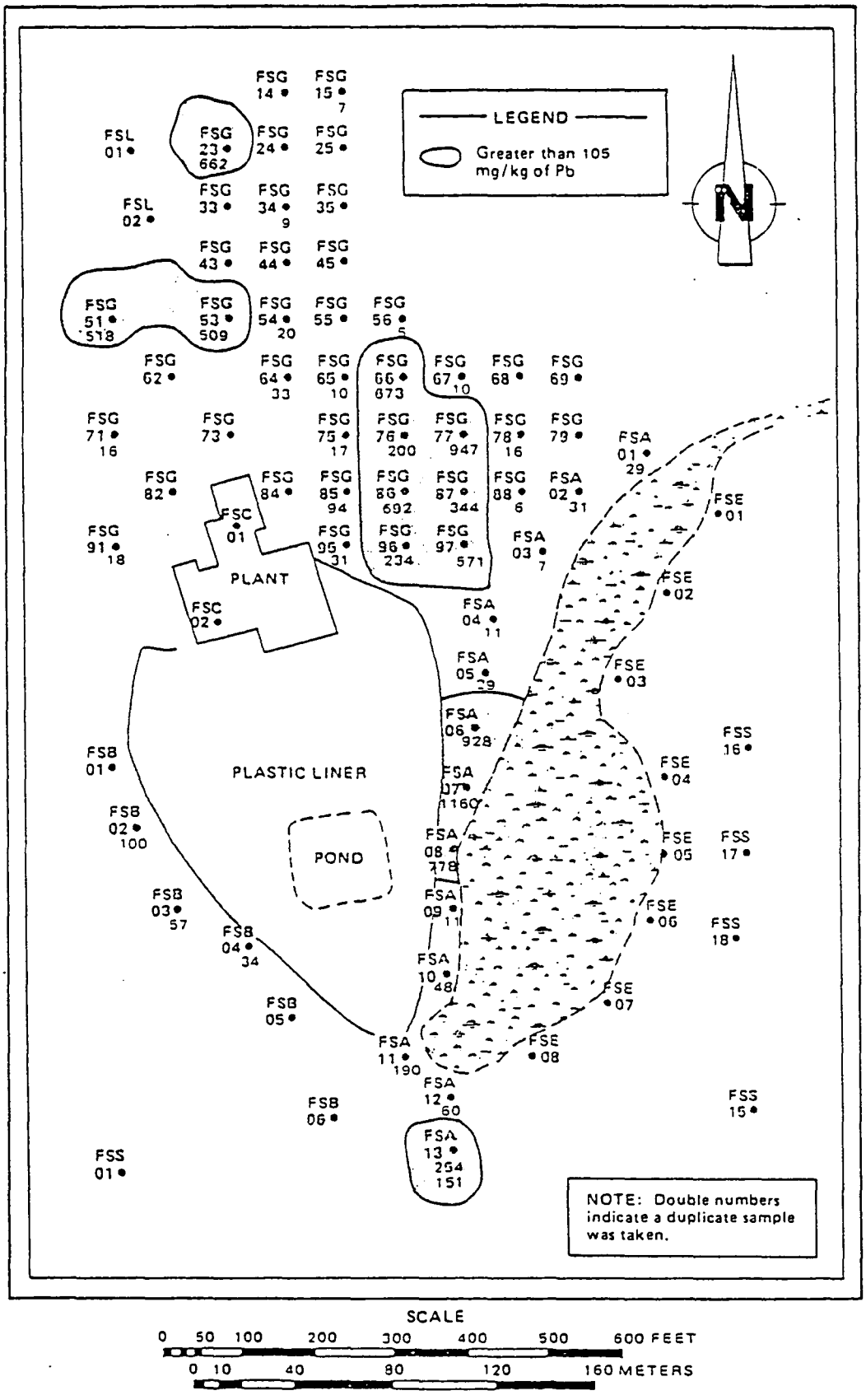
LEAD CONCENTRATIONS (mg/kg) IN THE C INTERVAL (2.5–5.0 Feet) SAMPLES OF ON–SITE SOIL BORINGS

FIGURE 6



LEAD CONCENTRATIONS (mg/kg) IN D INTERVAL (5.0 TO 7.5 FEET) SAMPLES OF ON–SITE SOIL BORINGS

FIGURE 7



LEAD CONCENTRATIONS (mg/kg) IN E INTERVAL (7.5–10.0 Feet) SAMPLES OF ON-SITE SOIL BORINGS

FIGURE 8

TABLE 4

Surface Water Quality Results

Standard Parameters

Sample Number	Date of Sampling	pH SU	Total Acidity mg/l	Akalinity mg/l as $CaCO_3$	Specific Conductance umhos/cm	Sulfide mg/l	Sulfate mg/l
SW-101	5-25-83	3.2	10	0	1420	0	891
SW-102	5-25-83	3.4	1.3	0	568	0	170
SW-103	5-25-83	3.3	NA	NA	250	0	53
	10-26-83	3.0	0.8	0	471	NA	NA
SW-104	5-25-83	3.3	2.1	0	420	0	130
SW-105	5-25-83	4.2	0.3	0	76	0	13
SW-106	5-25-83	4.2	0.5	0	56	0.4	29
SW-107	5-25-83	4.3	0.4	0	39	0.2	17
SW-108	5-25-83	4.5	1.2	0	42	1.5	18
SW-109	5-25-83	4.4	0.9	0	70	0.6	32
SW-110	5-24-83	4.5	0.4	0	46	0.1	
SW-111	5-24-83	4.0	0.5	0	94	0	18
SW-112	5-24-83	4.6	0.4	0	55	0	18
SW-113	5-24-83	5.7	0.5	9.5	50	0	16
SW-114	5-24-83	5.1	0.5	6.6	67	0	10
SW-115	5-23-83	4.3	0.2	3.9	63	0	10
SW-116	5-23-83	4.6	0.3	4.9	31	0.1	12
SW-117	5-24-83	4.9	0.3	4.3	31	0.2	3.2
SW-118	5-24-83	4.8	0.3	4.6	33	0.1	12
SW-119	5-25-83	5.7	NA	14	33	0.1	9.4

NA - Material was not analyzed.

TABLE 5

Surface Water Quality Results
Metals Analysis

Sample Number	Date of Sample	Metals Concentration ug/l								
		Pb	Cu	Sb	Cd	Ni	As	Mn	Al	Se
SW-101	5-25-83	4,100	26	3	35	64	1	4,400	11,000	< 1
SW-102	5-25-83	5,100	10	8	3	10	4	480	9,400	1
SW-103	5-25-83	37	3	6	1	3	6	110	< 100	1
SW-103	10-26-83	100	NA	<200	<10	NA	<10	170	8,200	< 1
SW-104	5-25-83	100	4	2	1	1	3	270	9,400	NA
SW-105	5-25-83	66	2	17	1	6	16	100	1,500	< 1
SW-106	5-25-83	12	2	2	1	4	1	60	< 100	< 1
SW-107	5-25-83	18	4	< 1	1	5	2	40	400	< 1
SW-108	5-25-83	21	2	2	1	3	1	130	8,000	1
SW-109	5-25-83	<100	3	7	1	5	6	60	8,100	< 1
SW-110	5-24-83	16	2	< 1	1	3	1	40	3,200	< 1
SW-111	5-24-83	34	4	5	1	2	5	70	9,700	< 1
SW-112	5-24-83	8	2	2	2	7	3	60	6,000	< 1
SW-113	5-24-83	25	7	4	1	6	6	60	3,600	< 1
SW-114	5-24-83	8	2	1	3	3	4	80	< 100	< 1
SW-115	5-23-83	9	2	< 1	1	7	4	80	< 100	< 1
SW-116	5-23-83	4	2	< 1	1	3	1	70	< 100	< 1
SW-117	5-23-83	6	4	< 1	1	6	1	90	600	1
SW-118	5-24-83	4	2	< 1	1	2	1	80	2,000	< 1
SW-119	5-25-83	31	2	< 1	1	2	1	80	260	1

NA - material was not analyzed.

that by far the most contaminated surface water bodies were the Holding Pond and the West Swamp. The lead content in the East Swamp, though still fairly high, is more than 40 times less than that measured in the West Swamp and the Holding Pond. In all the remaining offsite stations, the surface water did not appear to be highly contaminated with lead. The metals values continue to fall as the sampling stations become further removed from the site, by Station 115, they are only marginally above background.

The results of the Remedial Investigation sediment sampling effort are detailed in Table 6. In general, the highest lead concentrations could be found in the West Swamp, the Holding Pond and the West Steele City Bay. As these areas were the primary receiving areas for the battery acid effluent, this result was not surprising. The results from the other sampling stations indicate spotty, highly localized areas of contamination in Steele City Bay. As with the surface water samples, the sediment samples further removed from the site were showing close to background levels of contamination.

As part of the Summary Report priority pollutant confirmation study, five surface water and sediment samples were taken and analyzed for priority pollutants. The results of the priority pollution confirmation study for the most part supported the theory that selected metals are the only contaminants of concern for the surface water and sediments. The low levels of organics that were found could most probably be identified as laboratory contamination. The exception to this is the finding of bis (2-ethylhexyl) phthalate. This most probably can be attributed to the leaching of plasticizers from the large volume of plastic battery chips in the immediate vicinity of these specific sampling areas.

No further surface water sampling was done; however, an extensive sediment sampling program was implemented for the Summary Field Investigation. The onsite sample locations are shown on Figure 9 and the offsite sample locations are located on Figure 10. The sampling parameters are pH, lead, cadmium, and antimony. For the purpose of clarity, the following discussion of analytical results is divided into five geographical areas.

In the Northwest Swamp, five locations were sampled. In the 0-0.5 feet depths, levels of lead in this area ranged from 110 to 520 mg/kg. In the 0.5 feet and 2.5 feet sample depth, the concentration decreased ranging from 25 mg/kg to 70 mg/kg. Only traces of cadmium and antimony were found in a couple of samples; in all cases, pH decreased with depth.

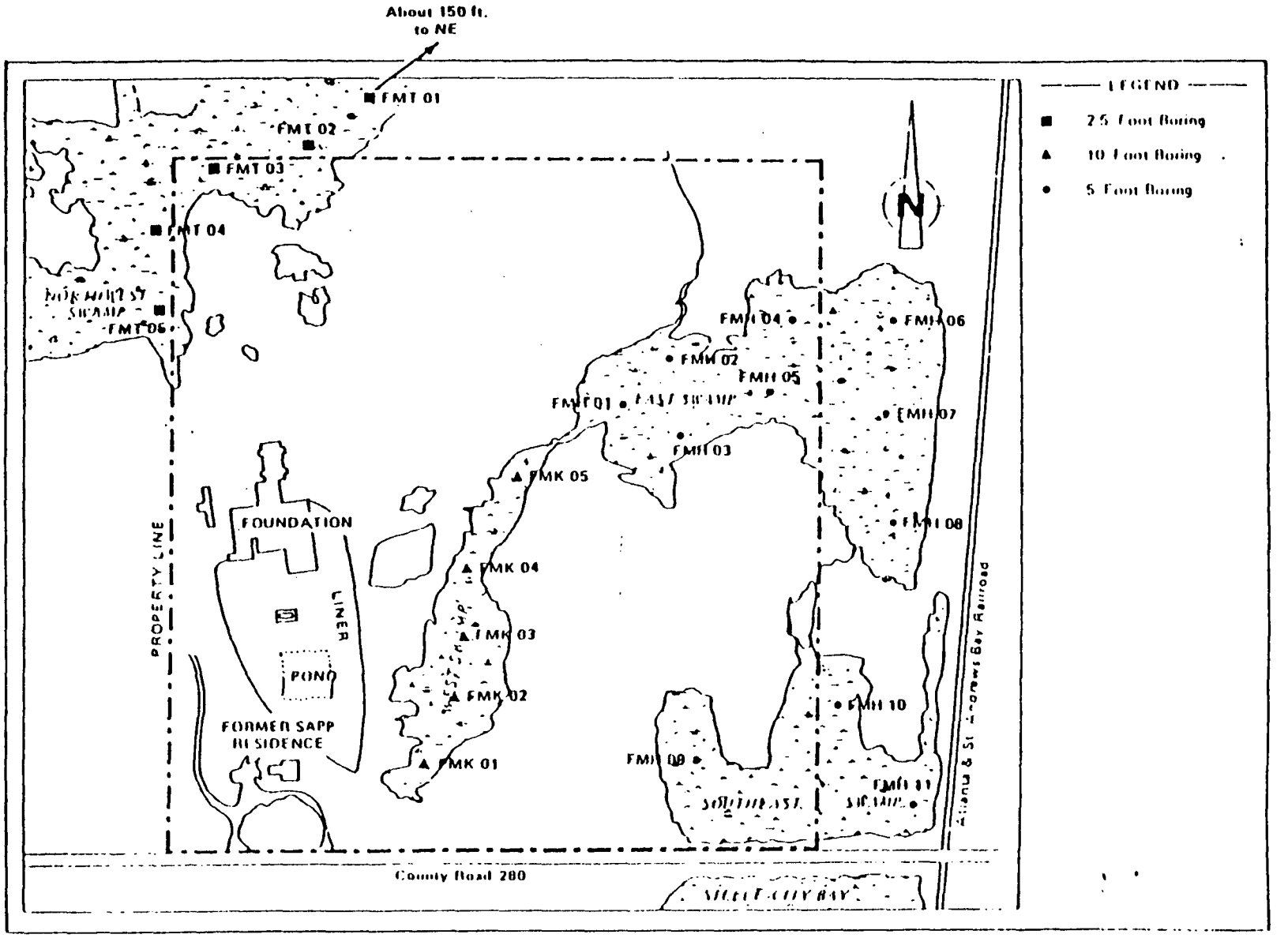
In the West Swamp, fifteen samples were taken from five boring locations. The borings were sampled at intervals of 0-0.5 feet, 0.5-2.5 feet, and 2.5-5.0 feet. The sample results indicate that the 0-2.5 feet layer of sediment is still contaminated, with the worst contamination being at the southern end of the West Swamp.

In the East Swamp, eight locations were sampled by five-foot borings.

TABLE 6
Sediment Analytical Results

Sample Number	Metals Analysis mg/kg								
	Pb	Cu	Sb	Cd	Ni	As	Mn	Al	Se
SD100	396	43	<44	<0.9	7.2	NA	14.9	59,868	NA
SD101	14,590	6.2	< 8	1.8	3.4	NA	12.7	15,817	NA
SD102	4,354	5.2	27	2.9	3.1	NA	57	5,051	NA
SD103	90	30	19	10	<10	<1	4	1,100	1
SD104	60	90	1	10	20	<1	25	290	<1
SD105	18,700	31	34	<0.5	12	NA	101	47,579	NA
SD106	30	7	1	5	<10	<1	4	550	3
SD107	40	20	< 1	10	20	<1	11	1,400	<1
SD108	< 10	60	< 1	40	<10	5	100	30,000	1
SD109	720	40	12	30	30	<1	40	4,200	1
SD110	10	3	< 1	5	<10	<1	6	610	<1
SD111	10	10	< 1	5	<10	<1	6	640	1
SD112	50	20	3	8	<10	<1	6	970	1
SD113	70	10	1	7	<10	<1	26	840	<1
SD114	< 10	4	< 1	7	<10	<1	8	810	<1
SD115	< 10	1	< 1	3	<10	<1	<1	340	<1
SD116	< 10	2	< 1	2	<10	<1	<1	250	<1
SD117	< 10	1	< 1	3	<10	<1	<1	320	<1
SD118	< 10	2	<1	3	<10	<1	<1	320	<1
SD119	10	6	<1	6	<10	<1	<1	760	<1

NA - Material not analyzed.



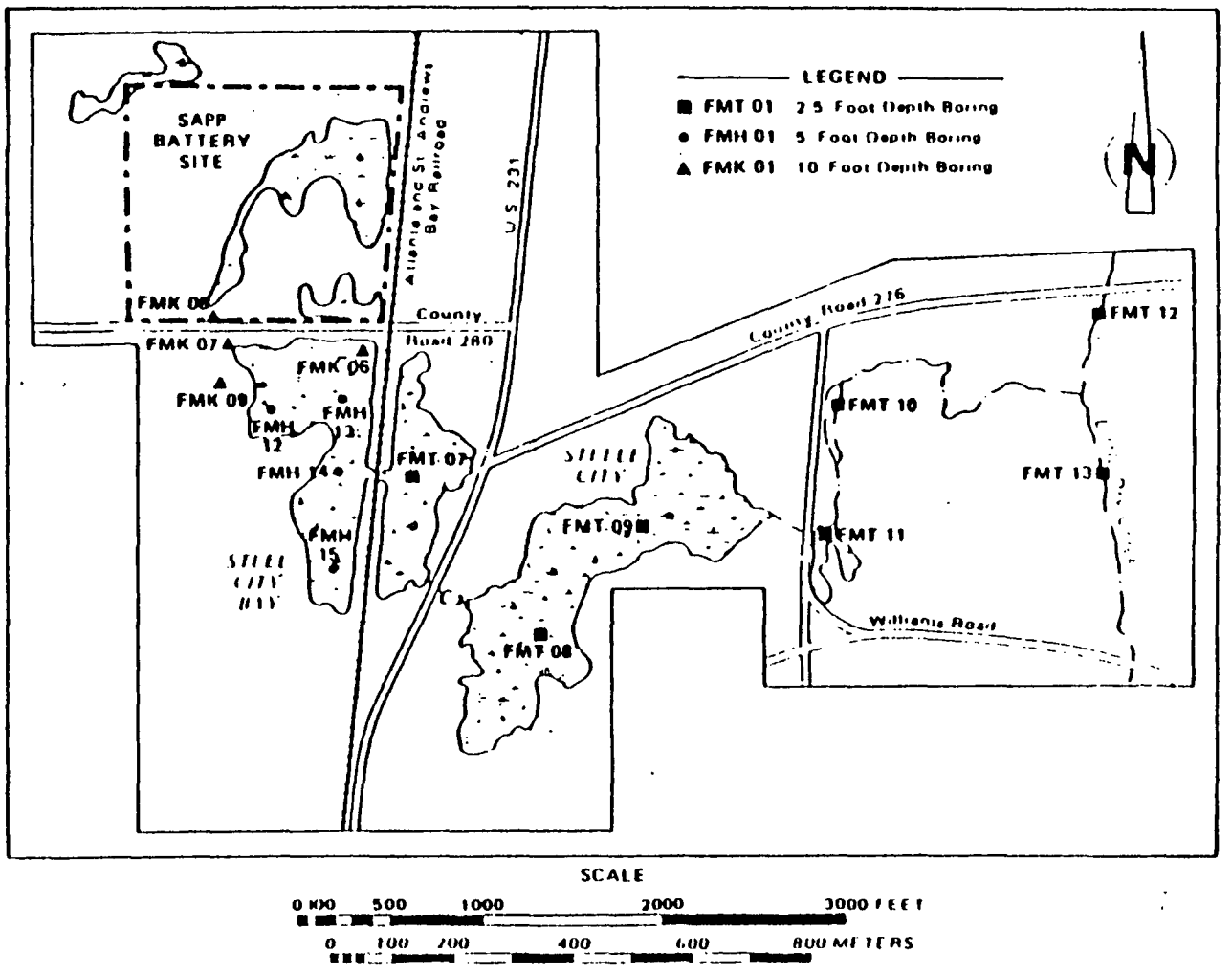
SCALE

0 50 200 400 600 800

50 100 150 200 METERS

ON-SITE AND ADJACENT SEDIMENT SAMPLE LOCATIONS

FIGURE 10



SCALE

0 100 500 1000 2000 3000 FEET

0 100 200 400 600 800 METERS

OFF-SITE SEDIMENT SAMPLE LOCATIONS

Samples were taken at the same sample intervals as for the West Swamp. In the 0-0.5 feet sample range, only one sample was heavily contaminated with lead; this was the sample location nearest the canal that drains the West Swamp into the East Swamp. None of the deeper samples indicated anything more than superficial levels of contamination.

In the Southeast Swamp, three five-foot borings were taken and sampled at the same intervals as the East Swamp. Levels of contamination were similar to the levels that were found in the East Swamp.

A number of borings were taken from the Steele City Bay and from the wetlands area between US Highway 231 and Little Dry Creek. In general, the same trend of lead concentration decreasing with depth that is found in the onsite swamps can also be seen in the offsite sediment samples. The heaviest contaminated areas seem to be localized near the culvert that used to carry surface water drainage from the onsite swamp areas into Steele City Bay.

GROUNDWATER INVESTIGATION

An extensive groundwater investigation was conducted as part of the Remedial Investigation. A total of twenty-nine monitor wells were installed in and around the Sapp Battery Site. This, in conjunction with the boring program, the geophysical work and the pump test, provided a comprehensive data base for the site.

Eleven wells were installed in the surficial aquifer. They were sampled for a select number of metals as well as for the standard physical parameters. The sample results indicated that the surficial aquifer has been heavily contaminated with lead levels ranging from a low of 9 ppb to a high 4300 ppb. The areas of worst contamination seem to occur in the Holding Pond area and in the Northwest Landfill. However, almost all of the surficial aquifer wells have been impacted by contamination.

Eleven monitor wells were installed into the intermediate aquifer. The remaining seven wells were installed into the Floridan Aquifer. These wells were sampled for the same parameters as the surficial aquifer wells.

Though not as severely, the intermediate aquifer showed clear indications of contamination. The lead levels were most seriously elevated, not surprisingly, in the wells between the old plant foundation and the West Swamp. The Floridan Aquifer wells in this area were also contaminated with lead levels that were above MCLs.

When interpreting these results, one must take into consideration that the area in general, and site-specifically, shows evidence of numerous subsidence features. The conclusion of the RI is that the major vector of migration of the groundwater in the upper two aquifers is vertical. Thus, contamination contained in the upper two aquifers appears to be

migrating directly into the Floridan Aquifer, which serves as the primary drinking water supply for people in the region.

As part of the Summary Report Investigation, nine additional monitor wells were installed and, then, all of the monitor wells were sampled for the selected parameters. As with the RI results, all of the wells indicated some level of contamination. For the surficial and the intermediate aquifers, the worst levels of contamination occured primarily in the west-northwest area of the site; sharing the same location as the area of the worst soil contamination. Lead levels in the southwestern and the eastern parts of the site seem to have either remained the same or dropped off somewhat.

Lead concentrations measured in the onsite Floridan Aquifer system are, again, highest in the western half of the site. Furthermore, the Floridan system, for the most part, shows very large increases in lead concentrations relative to those found in the earlier Remedial Investigation.

Lead concentrations in all three aquifer systems are depicted graphically in Figures 11 - 13.

Water level elevations in all three aquifer systems tend to support the RI's conclusion that there is a strong natural vertical gradient that is much greater than the shallow horizontal gradient. This would support the downward migration of contaminants into the upper part of the Floridan Aquifer system, especially where confinement is less effective. This condition is sustained at the Sapp Battery Site.

PUBLIC HEALTH ASSESSMENT

As part of the original Cooperative Agreement Award, a program of regular sampling of nearby residential wells was instituted. As of this writing, there have been five rounds of sampling. There have been no violations of Primary Drinking Water Standards for lead that have been detected so far. However, there has been a general trend of increasing lead levels in residential wells that are downgradient from Sapp Battery.

In 1984, the Florida Health and Rehabilitative Services (FHRS) set up a program to test the blood of residents in the area for elevated lead levels. Most of the people that were tested showed no signs of elevated lead levels; of the few that did, none of these individuals had any past connection with the Sapp Battery Site.

CLEANUP CRITERIA

The extent of the contamination currently on-site can be seen in Table 7. As part of the FS process, indicator chemicals were selected. The indicator chemicals were selected from the list of contaminants found in each medium and were chosen to represent the worst of the site contaminants.

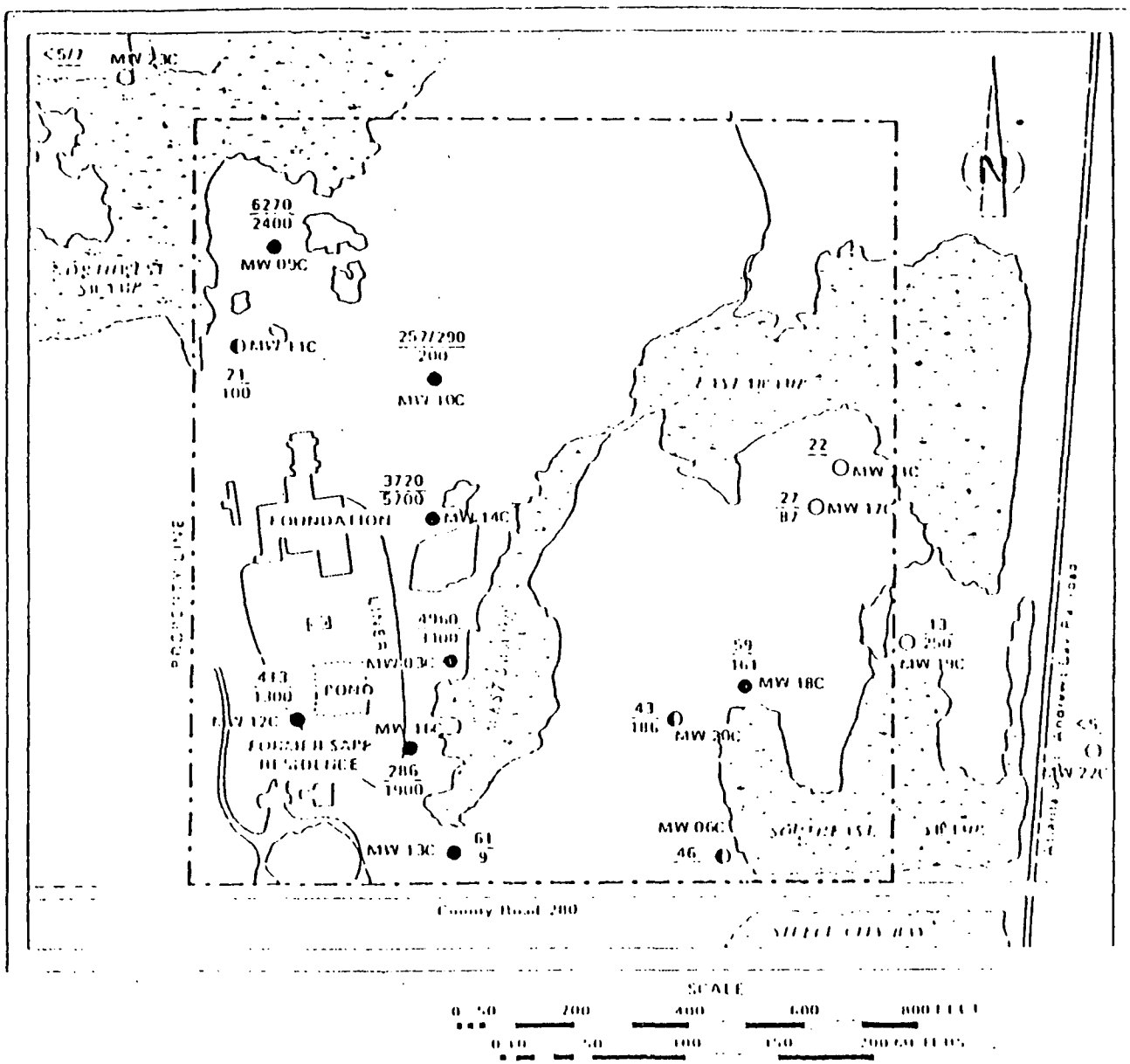
Cleanup criteria for the indicator chemicals were then set. Federal and State standards were used when applicable. Otherwise, a risk-based approach was applied to develop site specific cleanup goals. The indicator chemicals and the cleanup criteria are shown in Table 8.

During the internal review of the August 1986 Feasibility Study Report, questions were raised concerning some of the assumptions that were used to develop the cleanup criteria. The major questions were as follows:

- For the calculation of the soil lead cleanup criteria, the assumption was that 20% of lead is obtained from drinking water. The calculation for the pRMCL that was published in the 11/13/85 Federal Register used a different percentage.

- The antimony soil cleanup criteria was based on the assumption that 292 ug/day was an acceptable intake from drinking water for an adult. In fact, 292 ug/day is the total ADI for an adult.

Several other less pressing questions were also brought up. Accordingly, some of the criteria may be revised during the design phase of the project. These possible revisions would not impact the choice of remedy and would not significantly impact that amount of contaminated material to be treated. It is anticipated that approximately 95,000 cubic yards of soil and 22,000 cubic yards of sediment would be treated.



LEGEND

- ● greater than 50
- ◐ greater than 20, less than 50
- O less than 20

NOTE: November-December 1985 results are above the line and May-October 1986 results are below the line

NOTE: Double numbers indicate a duplicate sample was taken

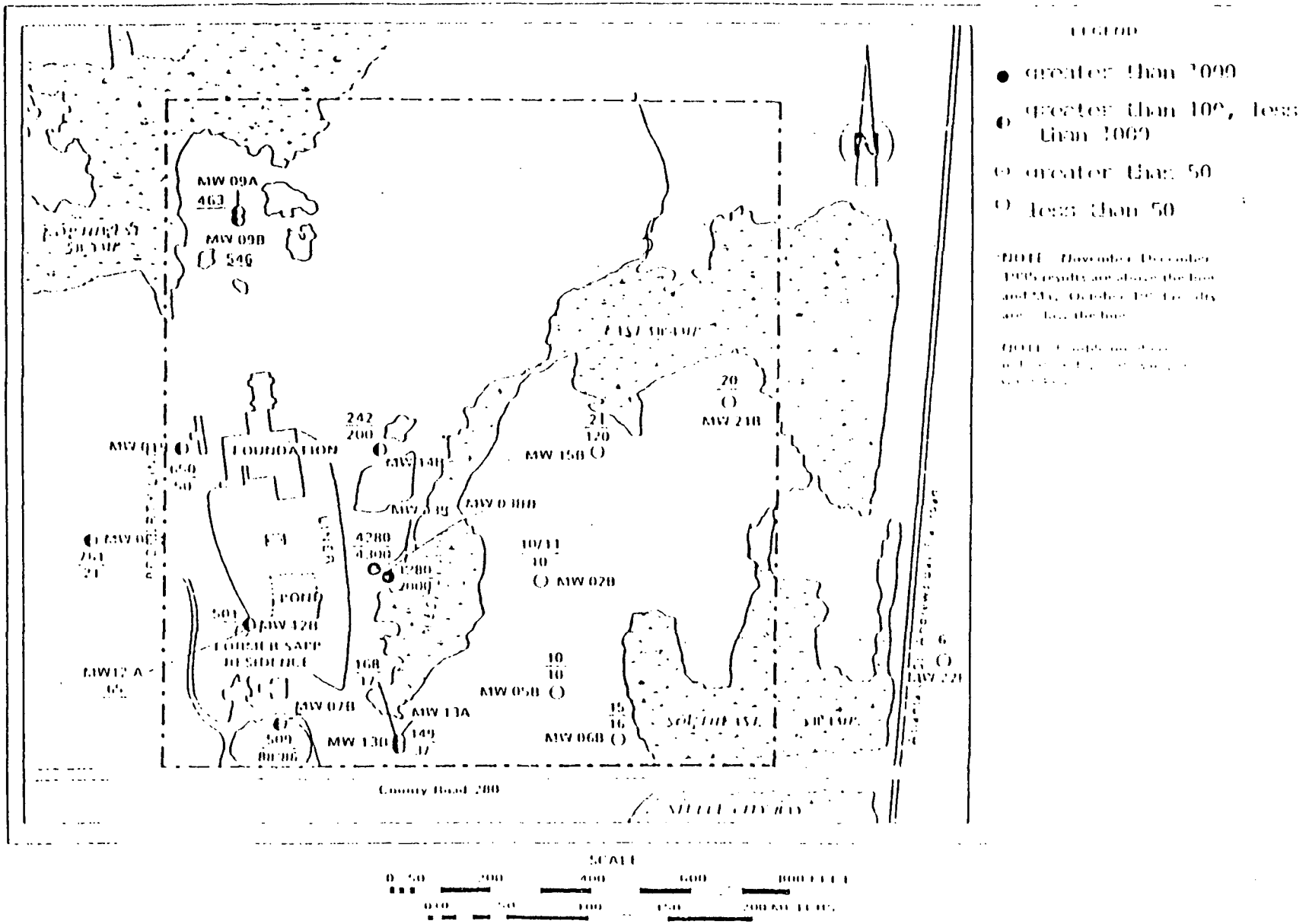
SCALE

0 50 200 400 600 800 FEET

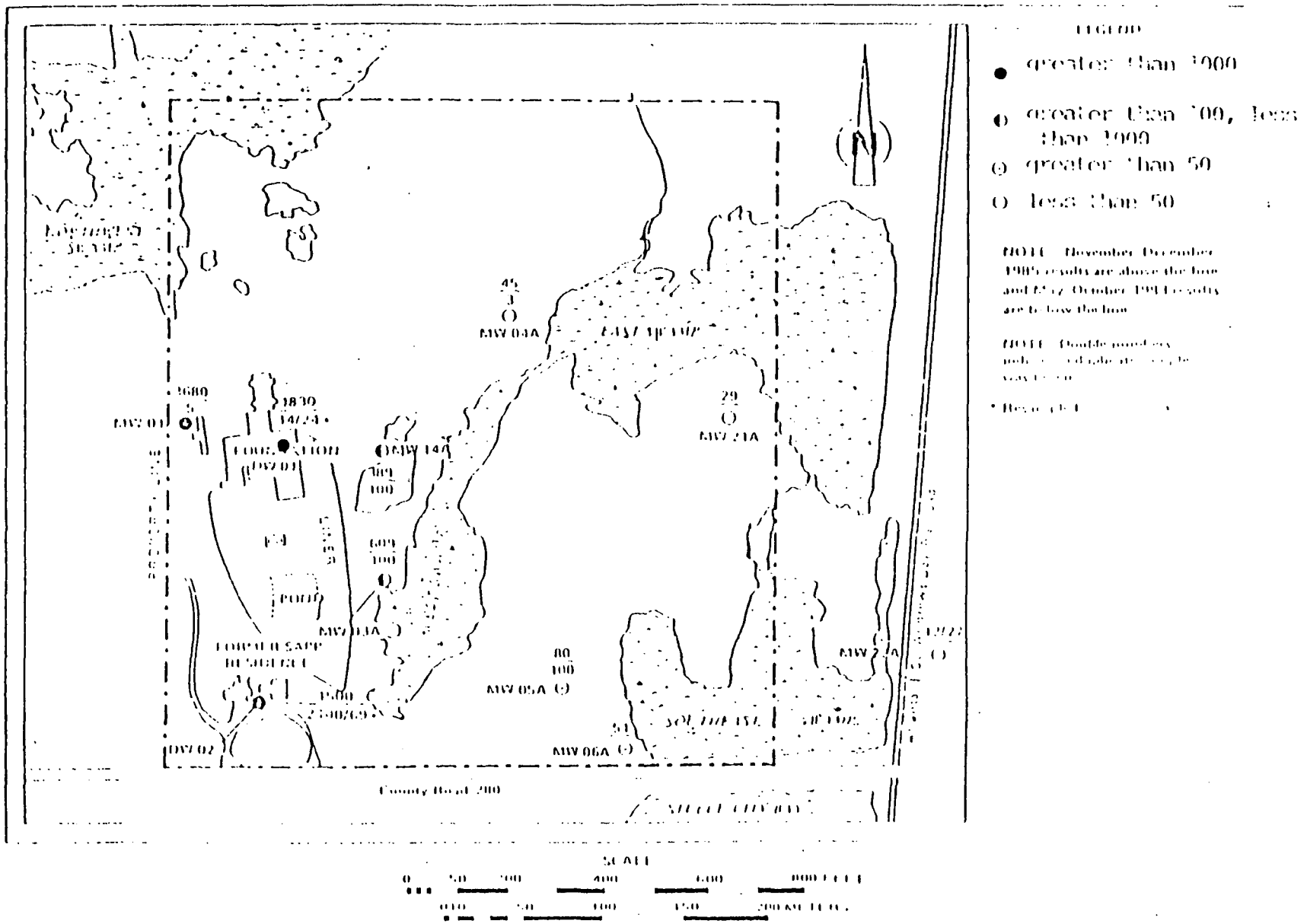
0 10 50 100 150 200 METERS

LEAD CONCENTRATIONS (ppb) IN MONITORING WELLS OPEN TO THE SURFICIAL AQUIFER SYSTEM

FIGURE 15



LEAD CONCENTRATIONS (ppb) IN WELLS OPEN TO THE INTERMEDIATE AQUIFER SYSTEM



LEAD CONCENTRATIONS (ppb) IN WELLS OPEN TO THE FLORIDAN AQUIFER SYSTEM.

TABLE 7

EXTENT OF CONTAMINATION SUMMARY

Environmental Media	Contaminant Concentration Range (ppm, except pH, which is in pH units)*									References
	Al	As	Cd	Mn	Ni	Pb	Sb	pH	Sulfates	
Soils										
• On-site	NA	NA	0.66-5.07	NA	NA	2.0-135,000	0.46-857.0	2.66-8.54	NA	A,B
• Off-site	NA	0.71	ND	NA	2.5	8.87-490.0	ND	NA	NA	A,B
Sediments										
• On-site	NA	NS	0.49-5.07	NA	NA	2.16-34,700	0.55-216.0	2.79-7.05	NA	A
• Off-site (from 1985)	1012.0-8799.25	ND	0.04-0.73	NA	2.2	2.22-252.22	ND	NA	NA	A,C
Surface Water										
• On-site	NA	0.006	ND	NA	ND	0.034-145.7	ND	2.0-6.5	53.0-891.0	A,B,C,D,E
• Off-site	0.50-6.60	ND	ND	0.05	0.038	0.014-2.86	ND	3.4-5.4	3.2-130.0	A,C,D,E

TABLE 7 (cont)

Environmental Media	Contaminant Concentration Range (ppm, except pH, which is in pH units)*									
	Al	As	Cd	Mn	Ni	Pb	Sb	pH	Sulfates	References
Groundwater										
• Monitoring Wells (1985)										
- Surficial	1.5-285.0	0.006-0.282	0.001-0.076	0.028-28.1	ND	0.007-4.96	0.118	3.5-8.2	70.0-11000.0	A,E
- Intermediate	0.986-987.0	0.021	0.002-0.246	0.025-17.4	0.495	0.006-4.28	ND	3.0-6.0	1.0-10000.0	A,E
- Floridan	0.559-115.0	0.014-0.092	0.002-0.026	0.030-2.46	0.028	0.012-3.68	ND	4.3-8.0	1.0-470.0	A,F
• Residential Wells (1985)	0.038 0.125	ND	0.003-0.008	0.004-0.296	0.025	0.007-0.039	ND	6.8-8.2	2.0-10.0	A,B,F
Air	NA	NA	NA	NA	NA	0.039-6.72 (units: ug/m³)	NA	NA	NA	B,F

References

A - E & E 1985
B - ESE 1985
C - FSU 1985
D - Heavy Metals Task Force 1985 (Station 14 only)
E - FDER Remedial Investigation
F - OH Materials Co.

NA - Not Analyzed
ND - Not Detected

*Where only one value is given, only one sample had detected compound.

TABLE 8

Contaminants	Groundwater (mg/l)	Surface Water (mg/l)	Soils (mg/kg)	Sediments (mg/kg)	Air (ug/m3)
Aluminum	5.0	0.150	NA	3,966	NA
Antimony	NA	NA	248	NA	NA
Arsenic	0.05	NA	NA	NA	1.2
Cadmium	0.01	0.0008	5.2	143	0.5
Lead	0.05	0.03	79 105	200	1.5
Manganese	0.05	NA	NA	NA	NA
Nickel	0.15	NA	NA	NA	NA
pH	NA	+ or -1 of normal	NA	NA	NA

SECTION IV

ENFORCEMENT - SAPP BATTERY SITE

SITE HISTORY

The Sapp Battery Salvage Company was originally owned by Mr. Brown Sapp. The company was engaged in purchasing used automotive batteries for reconditioning and resale. In 1970 Mr. Brown Sapp's son, Mr. Jerry Sapp, took over the company and began an operation which included cutting open old batteries to reclaim the lead for resale. Under Jerry Sapp's operation the company grew from employing 6 employees to 85 employees. Approximately 12,000 square feet of building space was added to the site, in addition to truck weighing scales, loading docks, chipping mills for breaking up battery casings, and a lead storage area.

The Florida Department of Environmental Regulation (State) began receiving complaints about the Sapp Battery Salvage Company's contamination of the Steel City Bay and cypress trees swamp in the spring of 1978. The State issued a Warning Notice to Mr. Jerry Sapp in July of 1978 and again in 1979 on an unpermitted discharge of materials. In response to the Warning Notices Mr. Sapp made unsuccessfull attempts to alleviate the off-site discharge.

In November 1979, the State issued a Notice of Violation to Jerry Sapp for an unpermitted discharge of materials, water quality violations, illegal discharge and illegal dredging and filling. EPA conducted a cleanup action in August 1980 to correct the extremely low ph and high lead concentrations in the Steel City Bay. However, by September of 1980 the low ph levels in the Steel City Bay had returned.

In January 1981, Mr. Jerry Sapp stopped operations, removed all the structures, equipment from the site, and sold the land to his inlaws, Mr. and Mrs. Herdice Ivey.

The State received a final judgement of the Notice of Violation enforcement case it filed against Mr. Jerry Sapp on July 10, 1981. Mr. Sapp was required to pay the State $11,159,000 of which they collected $11,000. The court found that Mr. Sapp had no visible means to fund the assessed judgement and released him from further financial liability.

ENFORCEMENT ANALYSIS

EPA and the State entered into a cooperative agreement allocating "Superfund" monies to conduct a Remedial Investigation for study of the contamination caused by the Sapp Battery Salvage Site. The State has the enforcement lead on the site with EPA tracking the State's efforts.

In March 1982, CERCLA §104 Notice letters were issued to the potentially responsible parties (PRPs). PRP's at this Site include Mr. Jerry Sapp, the Sapp Battery Salvage Company, and Mr. and Mrs. Herdice Ivey, the current land owners. In April of 1984 EPA contractors, GCA, performed a financial assessment of Sapp Battery Salvage Company. The contractors found that it was impossible to trace the sale or transfer of Sapp Battery Salvage Company assets due to the State of Florida's and Jackson County's recording requirements and procedures.

The PRP's on this Site are financially unable or unwilling to perform the desired cleanup at the Site. It is recommended that the remedial design and remedial action (RD/RA) proposed for the Site be funded with Superfund monies.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

The Site has been inactive since 1981. Prior owner's and operator's business activities consisted of recovering lead from batteries. Waste-water containing battery acid and dissolved heavy metals were discharged to cement lined pits which overflowed into an unlined pond onsite. Battery casings were disposed of in several onsite fills.

Sampling results have shown contamination of soils, surface water, groundwater and sediments on the Site with lead, manganese, aluminum, cadmium and antimony. Run-off discharges from the Site have adversely impacted the Steel City Bay, resulting in an emergency cleanup by EPA. It has been determined that contaminated waters from the Site are seeping into the Floridan Aquifer. Residents in the Cities of Alford, Steel City and Kynesville, use wells located in the Floridan Aquifer and are thus threatened by contamination. The Sapp Battery Salvage Site was placed on the National Priorities List on October 23, 1981.

Under Alternative No. 5, The contaminated soils, and sediments will be excavated. The excavated materials shall be solidified to form a solid mass of impermeability and placed in on-site disposal cells these lined disposal cells are to be constructed above grade in conformance with the State of Florida Class I Sanitary Landfill Standards and capped with a liner and soils and revegetated. The solidification system will be operated in conformance with RCRA standards for a waste treatment system. The treated material will be managed as an industrial, non-hazardous, waste. All excavated areas will be backfilled with clean material, graded and revegetated.

Extraction and treatment of groundwater and surface water will be conducted so that they meet the maximum contaminant limits established by the National Interim Drinking Water Regulations, State of Florida Drinking Water Regulations, and EPA recommended maximum contaminant limits.

Surface application of treated groundwater and surface water would require NDPES Permit. RCRA Permits will be required for the groundwater treatment facility. On site groundwater recovery and treatment will control further migration of contaminants.

Alternative No. 5 is a cost effective, technologically feasible and reliable process which requires minimal long term maintenance. Bench-scale testing of the solidification process will be performed prior to design and construction to identify reagent dosage rates to insure effectiveness and feasibility. This alternative effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare and the environment at the Sapp Battery Salvage Site.

SECTION V
ALTERNATIVES CONSIDERED

PRELIMINARY SCREENING

A vast range of remedial technologies were considered for inclusion in the Feasibility Study. As stated in the NCP, the preliminary remedial technologies that were considered for Sapp Battery can be broken down into two general categories: source control measures and management of migration measures. As required, the no-action alternative was included in the analyses.

The source control remedial technologies are as follows:

- Disposal in secure landfill
- Thermal treatment
- Solution mining
- Neutralization/detoxification
- Capping
- Permeable treatment beds
- Bioreclamation
- Solidification

Because of their nature, several of the source control measures can also be considered management of migration (MOM) measures for the purpose of controlling surface water and sediment migration.

The MOM measures considered were as follows:

- Slurry trench
- Grout curtain
- Water table adjustment
- Plume containment
- Groundwater treatment
- Alternative water supply
- Diversion/collection structures

- Regrading/revegetation

The preliminary alternatives were then screened based on the following criteria: (1) cost; (2) environmental impact; (3) public health effect; (4) regulatory compliance; and (5) engineering feasibility. The process is shown on Table 9.

REMEDIAL ALTERNATIVES

The remedial technologies that passed the screening process were then grouped into a series of six remedial alternatives. Included in this list is the mandatory no-action alternative as well as alternatives that fulfill the requirements of 40 CFR 300.68 (f). The remainder of this section is devoted to describing the remedial alternatives in detail.

ALTERNATIVE NO. 1: NO-ACTION

The no-action alternative would involve maintaining present site conditions and continuing groundwater and surface water monitoring. The remediation measures that have been undertaken to date would be maintained in their present state, with the site fencing extended on the north side to complete a full enclosure.

Additional monitoring wells to monitor the movement of the contaminant plumes would not be necessary. However, the potable water supply wells within a 1-mile radius of the site should be sampled and analyzed regularly (once a year) to determine whether heavy metal concentrations in the potable water supply reach levels which exceed the state groundwater quality standards.

ALTERNATIVE NO. 2: OFF-SITE DISPOSAL, GROUNDWATER TREATMENT

The off-site disposal alternative would involve complete source removal and the excavation of all contaminated soils, sediments, and wastes with subsequent transportation and disposal at a RCRA-permitted secure landfill. During removal operations, adjustment of the water table would be required for those areas where the depth of the planned excavation exceeds 5 feet. A French drain type system would be the most effective for this process. Dewatering would also lower the moisture content of the contaminated materials below the groundwater table, which would facilitate handling of the materials for transportation by a licensd carrier with proper manifest documentation to a nearby secure landfill. After excavation of the contaminated materials was complete, the excavations would be backfilled with clean, compacted fill, and then regraded and revegetated to control surface runoff and erosion.

TABLE 9
PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES

Remedial Technology	Evaluation Criteria: Cost	Environmental Impact ST	Environmental Impact LT*	Public Health Effect ST	Public Health Effect LT*	Regulatory Compliance	Engineering Feasibility	Retain Action
1. No action	3	1	1	1	1	1	3	Yes
2. Disposal in secure landfill								
• Off-site	2	2	3	2	3	3	3	Yes
• On-site	2	2	3	2	3	1	3	Yes
3. Thermal treatment	1	2	2	2	2	2	1	No
4. Solution mining								
• In-situ	2	1	1	1	1	1	1	No
• Continuous	2	3	3	3	3	2	2	Yes
• Batch process	2	3	3	3	3	2	3	No
5. Neutralization/detoxification	2	1	1	1	1	2	1	No
6. Capping	3	2	2	2	2	3	3	Yes
7. Permeable treatment beds	2	2	2	2	2	2	1	No
8. Bioreclamation	2	1	1	3	3	2	1	No
9. Solidification								
• Cement-based	2	2	3	2	3	3	3	Yes
• Pozzolanic	2	2	1	2	2	3	3	No
• Thermoplastic, organic polymer, self-cement, glassification	1	2	3	2	3	3	3	No
10. Slurry trench	2	1	1	1	1	2	1	No
11. Grout curtain	2	1	1	1	1	2	1	No
13. Water table adjustment	2	1	1	1	1	2	2	Yes
14. Plume containment	2	1	1	1	1	2	1	No
15. Groundwater and Surface water treatment								
• Biological	2	1	1	1	1	3	1	No
• Chemical oxidation	1	2	2	2	2	2	1	No
• Chemical reduction	1	2	2	2	2	2	1	No
• Hydrolysis	2	1	1	1	1	2	1	No
• Liquid-liquid solvent extract	2	1	1	1	1	2	1	No

TABLE 9 (cont.)

Remedial Technology	Evaluation Criteria: Cost	Environmental Impact ST	Environmental Impact LT*	Public Health Effect ST	Public Health Effect LT*	Regulatory Compliance	Engineering Feasibility	Retain Action
• Neutralization	3	2	2	2	2	2	2	Yes
• Ozonation/photolysis	2	1	1	1	1	3	1	No
• Physiochemical system	2	3	3	3	3	3	3	Yes
• Ion exchange	1	2	2	3	3	2	2	Yes
• Liquid ion exchange	1	2	2	2	2	2	2	No
• Reverse osmosis	2	2	2	3	3	2	1	Yes
• Ultrafiltration	2	2	2	3	3	2	2	Yes
• Freeze crystallization	1	3	3	3	3	2	2	No
• Carbon adsorption	1	2	2	2	2	2	2	No
• Aeration	2	1	1	1	1	2	1	No
• Rapid sand filtration	2	2	2	2	2	2	2	No
• Electrolysis	1	2	2	2	2	2	2	No
16. Alternative water supply								
• Tie-in with existing system	1	1	1	3	3	2	2	No
• Local treatment/distribution system	1	1	1	3	3	2	2	No
• On-line residential treatment systems	2	1	1	3	3	2	3	Yes
17. Diversion/collection structures	3	2	2	2	2	3	3	Yes
• Interceptor trenches		1	1	1	1	1	2	No
18. Regrading/revegetation	3	2	2	2	2	3	3	Yes

Key:

3 - favorable
2 - fair
1 - unfavorable

*ST = short-term impacts
LT = long-term impacts

The recovery system for the surficial aquifer is estimated to consist of 29 2-inch diameter wells with depths of ten to twenty feet. This system incorporates the existing site monitor wells. The reason for the large number of surficial wells and the associated small diameter is that this aquifer yields water at a low rate.

The recovery system for the Floridan aquifer would consist of a network of seven existing 4-inch monitor wells. To recover deep contamination, an additional 250 feet deep well would be installed.

A recovery system for the intermediate aquifer was not considered because the pump test conducted during the RI indicated that the intermediate aquifer system is lowered when the Floridan aquifer is pumped. In addition, the intermediate aquifer yields only small quantities of water, except in very localized areas. Thus, a large number of wells would be required.

Contaminated surface waters would be pumped from the west swamp, which would be hydrologically isolated from other surface water bodies, to the on-site treatment system. Pumping of the surface water would not begin until dredging of the contaminated sediments was complete, as silting of the water during dredging might contribute contamination to the water. In order to achieve the proposed discharge limit of lead in the treated groundwater and surface water, the precipitation/sedimentation/flocculation process might have to be combined with polishing treatments such as ion exchange, reverse osmosis, or ultrafiltration. Such additional treatment would increase the capital and O&M costs. Before any treatment facility could be designed, extensive pilot testing would have to be conducted to determine which type of treatment process was needed. Water removed for excavation purposes would also be treated in this manner, which would require installation of the treatment systems as the initial phase of site work. Treated water would be discharged by surface spraying, piping to surface water bodies, or injection into the Floridan aquifer. Contaminated sludge generated by the water treatment process would be dewatered as required and transported to the off-site RCRA disposal facility. Post-closure groundwater monitoring of residential and monitoring wells, as well as surface water, would be performed, with site maintenance as required.

ALTERNATIVE NO. 3: ON-SITE DISPOSAL, GROUNDWATER TREATMENT

This alternative is similar to the off-site disposal alternative except that the excavated contaminated materials would be disposed of in a secure landfill constructed on-site. The secure landfill facility would be a double-lined landfill constructed to meet 40 CFR 264 standards with a leachate collection system and an impermeable cap to minimize infiltration. All contaminated soils and sediment excavated from the site would be placed in this facility. Studies to determine the possible adverse

environmental and public health effects during construction and operation of an on-site facility would have to be conducted prior to implementation.

As with the previous alternative, groundwater from the shallow, and Floridan aquifer zones would be withdrawn via permanent withdrawal wells to be installed after closure of the secure landfill and site regrading. The withdrawn groundwater would be treated by precipitation, sedimentation, and flocculation processes before reapplication to the site by either spraying, surface application, or injection into the Floridan aquifer. The shallow aquifer groundwaters would be withdrawn by a series of well points as discussed for the previous alternative. Surface water from the west swamp would also be pumped and treated as in Alternative No. 2.

Excavated areas would be backfilled with clean, compacted fill before regrading and revegetation. Post-closure monitoring of the residential and monitoring wells and surface waters and site maintenance would be performed as required.

ALTERNATIVE NO. 4: CAPPING, ALTERNATIVE WATER SUPPLY

The capping alternative would serve to isolate designated on-site disposal locations for contaminated materials. Areas containing contaminated materials outside the disposal locations would be excavated with water table adjustment as required and transported to the disposal area. Contaminated sediments from the surface water bodies would be dredged and allowed to drain prior to being transported to the area(s) to be capped. The shallow contaminated soils from the east side of the west swamp would be removed by scraper pans and hauled to the areas to be capped. Drainage water from the dredged sediments would be allowed to drain back to the bodies from which the sediments were dredged. No on-site treatment of water is considered in this alternative, as dewatering for excavation and groundwater withdrawal would not be performed. The cap would consist of a 2-foot thick layer of compacted clay; covered by a 2-foot layer of soil. The cap would be revegetated.

The area that would be covered by the cap encompasses virtually all areas between the western site boundary and the west swamp, and includes the contaminated areas in the northwest corner of the site. The existing cap south of the plant foundation, which is exposed and is showing signs of deterioration, would be covered by the new cap. This capping scheme would eliminate the need for deep excavation of contaminated materials and dewatering and treatment of withdrawn water (the cost of extending the cap over the areas of deep contamination with a vegetative cover is less than the cost of dewatering and excavating an equivalent area). All areas to be capped would be cleared and grubbed.

Because long-term groundwater or surface water treatment is not a part of this alternative, an alternate water supply would be provided for nearby potable water users. The low population density of the area makes individual treatment units the only viable way of providing an alternate water supply.

Once capping was completed, the site would be regraded with uncontaminated soils and revegetated to control surface runoff and erosion. Post-closure groundwater sampling and analysis of monitoring wells, surface water monitoring, and residential well monitoring would be performed with site inspection and maintenance as required.

ALTERNATIVE NO. 5: FIXATION, GROUNDWATER TREATMENT

Chemical fixation involves mixing contaminated soils and sediments with a matrix material to prevent or inhibit transport of contamination by leaching. Type II or Type V portland cement (sulfate-resistant) is possibly the most cost-effective matrix material suitable for fixation. Sodium silicate may be added to reduce the permeability of the final mix.

As with the disposal alternatives, the contaminated soils and sediments would be excavated from the site. Dewatering of the areas to be excavated would probably be required, and dewatering of the excavated sediments might be necessary to facilitate handling. The excavated contaminated materials would be mixed with the cementatious matrix material, and placed in an on-site disposal cell built to Florida Class I Sanitary Landfill Standards. The excavated areas would be backfilled with clean, compacted fill, then regraded and revegetated.

Groundwater and surface water would be pumped and treated in the same manner as described for the disposal alternatives, as well as process water from dewatering the excavated sediments and areas to be excavated. If the sludge from the groundwater treatment process could not be chemically fixed, then it would be disposed of in an off-site Class I facility. The treated water would be reapplied to the site by spraying, piping to nearby surface water bodies, or injection.

Extensive pilot studies and bench-scale testing of the effectiveness of the chemical fixation process would be required before implementation to determine the optimum formulation which would prevent the contaminants from leaching. As with the other alternatives, post-closure monitoring of groundwater, potable well water, and surface waters and site maintenance would be performed.

ALTERNATIVE NO. 6: SOILS WASHING/FIXATION, GROUNDWATER TREATMENT

Solution mining involves pumping solvents, reactants, or chelating agents through a contaminated soil or sediment to flush out the contamination, then treating the flushing agent to precipitate the contaminants. This process can be performed in-situ, or the soil can be excavated and treated

by a batch process, or by passing it continuously through the treatment stage. The batch process is recommended because of the greater control over contact time with the contaminated soil, and the greater degree of mixing this method permits. It is anticipated that up to 50% of the contaminated soil could be treated with this system. The remainder would be solidified and disposed of onsite as in Alternative 5.

After the groundwater table was adjusted downward by pumping, the contaminated soils and sediment would be excavated and treated with a chelating agent (i.e., EDTA) to remove the lead. The soluble lead is then recovered from the EDTA and the EDTA is reconstituted for reuse. Extensive bench-testing and pilot studies of the soils washing process would be required to determine the effectiveness of lead removal and to prevent the resolubilization of elemental lead. After treatment, the flushed soils would be backfilled into the excavations and compacted. Soils washing would remove primarily solubilized lead adsorbed onto soil particles and very finely divided lead particles. Larger, discrete particles would not be affected by the solution mining process if a chelating agent were used, but could be dissolved with acids or strong alkali. Relative costs of soils washing are difficult to determine because of the proprietary nature of the process and its limited application to date.

As with the disposal alternatives, contaminated groundwater would be pumped from the ground by means of permanent withdrawal wells and well point systems to be installed on the site. The process water from the solution mining, contaminated water surface, and the pumped groundwater would be treated by precipitation/flocculation/sedimentation processes along with neutralization before reapplication to the site. The site would be capped to reduce infiltration, and then regraded and revegetated. Post-closure groundwater monitoring and site maintenance would then be performed as required.

RELIABILITY AND IMPLEMENTABILITY OF ALTERNATIVES

The six alternatives were evaluated according to the engineering feasibility and long-term reliability of the respective alternatives. The following summarizes the findings.

Alternative One - There are no engineering requirements; therefore, implementability and reliability do not apply. Consequently, the achievable level of cleanup is zero.

Alternative Two - Soil borings would be required to determine the limits of excavation work to be required. Bench and pilot scale testing would be required before design and implementation of the groundwater treatment facilities.

Implementing this remedy would require temporarily dewatering the surficial aquifer and some clearing of the land surface.

Excavation and offsite removal is considered a very effective technique for treating contaminated soils. With proper design and maintenance, the groundwater treatment system should be fairly reliable.

Alternative Three - This alternative would require the same special engineering considerations as Alternative Two. In addition, a secure RCRA-type landfill would have to be designed.

In implementing this alternative, the landfill would have to be constructed before excavation of contaminated soils. Otherwise, it is similar to Alternative Two.

Both on-site disposal in a RCRA-type landfill and groundwater treatment are considered very reliable technologies; on the condition that they are properly designed and maintained.

Alternative Four - The decision would have to be made on the most cost-effective way to provide an alternative water supply to the relatively sparse population in the area. The two methods being considered are running in water lines from the town of Marianna, about 10 miles away, or putting in an entirely new production well.

This alternative can be fairly easily implemented and if the gap is properly maintained, this alternative is fairly reliable. However, the level of cleanup achieved is low.

Alternative Five - Alternative Five is almost identical to Alternative Three. The major difference is that the contaiminated soil and sediment would be fixed in a cement matrix before being placed in an on-site landfill.

Bench and pilot scale testing would be required for the implementation of the fixation process.

The short-term reliability of the fixation process for metal contaminated soils is considered to be good. The long-term prognosis is not known.

Alternative Six - This alternative would require extensive bench and pilot scale testing of the soil washing technology. The equipment used for the soils washing would probably have to be designed and built from scratch.

The implementability and the reliability of the soils washing technique is unknown; however, experience on other projects would indicate that the soils washing technique would be difficult to implement and of questionable reliability.

ENVIRONMENTAL IMPACT

The six alternatives were evaluated to determine what sort of environmental impact each would have. The following results were determined:

Alternative One - The impact on air quality would be minimal. The impact of surface water, soils, and groundwater would remain severe because the source would continue to release contamination.

Alternative Two - The impact on air quality would be minimal. The impact on surface water could be moderate because the excavation of sediments will stir up silt. As the soil is being shipped off-site and the groundwater is being treated, the impact to both these media should be slight.

Alternative Three - The environmental impact is the same as for Alternative Two.

Alternative Four - The environmental impact on the air qulity would be slight. Because excavation of the sediment will cause silting, the impact on the surface water may be moderate. The impact on soils would be high because contaminated soils would be only partially contained by the cap. The impact on the groundwater would be high because the contaminated groundwater would continue to impact the Floridan aquifer and the partially contained soils would continue to produce leachate.

Alternatives Five and Six - The environmental impacts of these two alternatives would be the same as that described for Alternative Two.

COSTS

The capital costs were prepared using standard engineering estimations and are based on 1986 dollars. The costs were prepared using the volume estimations derived from the cleanup criteria. The estimated accuracy is between -20% and +50%.

The Operation and Maintenence (O&M) costs are projected for 30 years. For costing purposes, it was assumed the the wastewater treatment system would be in operation for seven of those years.

Table 10 shows the capital and the O&M costs for each alternative.

WETLANDS ASSESSMENT

Alternatives 2,3,5 and 6 all involve the excavation of wetland areas. These action are considered to prevent the continuing degradation of the wetland areas from the contaminated sediments. In order to prevent further releases into the wetlands, it is anticipated that any sediment excavation activities would occur during the dry season. It is also anticipated that the groundwater removal activities would temporarily lower the local surficial water table. Should dewatering activities be necessary, the affected areas would be temporarily isolated with earthern berms to prevent stirred up sediments from escaping into unaffected areas. Once excavation activities cease, all berms, walkways and other structures would be removed and the wetlands area would be allowed to restore itself naturally.

TABLE 10

Alternative	Costs		
	Capital	Annual O&M 1-7 years/1-30 years	Worth
1. No action	$56,463	$17,631/17,631	$222,663
2. Off-site disposal, groundwater treatment	26,441,475	433,864/23,631	28,661,413
3. On-site disposal, groundwater treatment	12,396,626	453,864/31,631	14,750,398
4. Capping, provision of alternative water supply	4,547,435	47,631/47,631	4,996,443
5. Solidifation, groundwater treatment	14,318,544	436,864/25,631	16,562,209
6. Solution mining/soil washing; groundwater treatment	16,539,563	436,864/25,631	18,778,355

SECTION VI
COMMUNITY RELATIONS

The community relations aspect of the project has been implemented by the lead agency, FDER. Funding for community relations was provided to FDER as part of the Cooperative Agreement. In addition, FDER conducted a fairly extensive community relations effort during its IRMs.

On August 28, 1986 FDER held a public meeting to present the findings of the Summary Report and the final draft Feasibility Study Report. Questions raised by the public at this meeting, as well as written questions submitted during the official public comment period, are addressed in the Responsiveness Summary.

It is anticipated that EPA, as the lead agency for the RD/RA, will take over the prime responsibility for community relations.

SECTION VII
COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

The applicable laws at the Sapp Battery site are as follows:

- Resource Conservation and Recovery Act, 1984 Amendments;
- National Environmental Policy Act;
- Various dredge & fill programs;
- Executive Order 11990;
- Florida Class III Surface Water Standards;
- Safe Drinking Water Act;
- Florida State Drinking Water Standards;
- Florida Class I Sanitary Landfill Standards.

By performing an RI/FS at the Sapp Battery site, the Agency has fulfilled the requirements of NEPA.

Alternative One is the no-action alternative and thus does not comply with RCRA. The other environmental laws would not apply.

Alternative Two would comply with RCRA. The types and levels of contamination that would be left in place would not violate RCRA hazardous waste laws. Because wetland areas would be affected, the Presidential Executive Order on wetlands would need to be adhered to and appropriate dredge and fill permits to be obtained. Should the option of injecting the treated groundwater into the Floridan be selected, a Class 5 Underground Injection Control permit would have to be obtained.

Alternative Three would have to meet the requirements of RCRA Part 264 for the on-site RCRA landfill. Otherwise the requirements are similar to the requirements of Alternative Two.

Alternative Four would not meet the requirements of RCRA because it would leave the contaminated material in place. The alternate water supply would have to meet the requirements of the Safe Drinking Water Act, 1986 Amendments. Other environmental laws would not be applicable.

Alternative Five would require that the on-site disposal cell meet Florida Class I Sanitary Landfill Standards. Otherwise, the requirements are similar to the ones for Alternative Two.

Alternative Six would have to meet the same environmental laws as Alternative Five.

SECTION VIII
RECOMMENDED ALTERNATIVE

SELECTED REMEDY

The recommended alternative is Alternative Five. This consists of solidification and onsite disposal of contaminated soils/sediments, surface water treatment and a groundwater recovery and treatment system. The soil and sediment volumes to be excavated are as described in Section IV of the ROD. Dewatering of the areas to be excavated would probably be required, and dewatering of the excavated sediments might be necessary to facilitate handling. The excavated materials would be screened, mixed with solidification agency and placed in an on-site disposal cell. The excavated areas would be backfilled as necessary with clean fill, graded, and revegetated.

The long-term performance of the solidified material would be tested and modeled. Testing would include studies on the effects of weathering and long-term leaching potential of the material.

Pilot-scale testing would also be conducted. Data derived from this testing would support design of the solidication equipment and be utilized to provide additional verification of the process. This verification is necessary, since the mixing efficiency of soil and application may impact final product characteristics.

It is estimated that the solidification phase of this project will require 2 years to complete. Considering the high volume of materials requiring management, the disposal area will be constructed, operated, and closed in phases or as several small, discrete cells, thus minimizing the surface area exposed to the elements, and hence, leachate collection and treatment requirements. The area along the central portion of the northern site boundary will be utilized as the disposal area. The design and operation of the facility will be in conformance with Florida Class I Sanitary Landfill Standards.

The treatment of groundwater and surface water will be accomplished by chemical precipitation on a continuous-flow basis. The inorganic compounds will be precipitated by addition of chemicals to the treatment water. Treatability studies are needed to determine design parameters and procedures. Design factors that must be determined for particular water quality parameters are:

- Best chemical addition system;
- Optimum chemical dose;
- Optimum pH conditions;
- Rapid mix requirements;
- Flocculation requirements;

- Sludge production; and
- Sludge flocculation, settling, and dewatering characteristics.

Two methods of disposing of the treated water were assessed in the FS. For costing purposes it was assumed that the treated water would be injected into the Floridan aquifer. However, the method of discharging the treated water into an offsite surface water body was also considered technically feasible. Both of these methods will be further assessed in the Remedial Design Phase and the most technically feasible, environmentally sound and cost effective method will be chosen.

The O&M for this remedy includes the maintenance of the water treatment system and the disposal cells. It is anticipated that the water treatment system will be in operation for seven years. The disposal cells will be maintained and monitored for thirty years. EPA will provide O&M costs for one year on the source control portion of the remedy; after which the State of Florida will assume O&M responsibility. EPA will provide 90% of the funding for the groundwater treatment system until the cleanup objectives have been met.

As part of the remedy, private wells within a one-mile radius of the site would be monitored. These private wells would be initially monitored once every six months. If, over a period of time, the data indicates that there is no significant increase in the levels of the contaminants of concern, the monitoring frequency may be reduced to once a year.

In addition to and concurrently with the implementation of the design phase, EPA's Environmental Response Team (ERT) will conduct laboratory tests on contaminated soils from the Sapp Battery site. The purpose of the tests will be to ascertain whether the soil/sediment cleanup goals can be reached using an EDTA based soils washing technology. Should the tests have positive results, EPA, in conjunction with FDER, will assess the desirability of integrating soils washing into the above described remedy.

APPENDIX A

RESPONSIVENESS SUMMARY

SAPP BATTERY SALVAGE SITE

FEASIBILITY STUDY

RESPONSIVENESS SUMMARY FOR PUBLIC MEETING

AUGUST 28, 1986

John Ellerbee	States that he thought it cost $3,000 a truck-load to haul out the excavated soils during the previously completed clean up. Question: 1) Where do you try to cut costs? 2) How was the excavated area backfilled and with what?
Brent Hartsfield	The cost for transportation of the excavated soils off site was approximately $800 per load. Since there were hazardous materials involved a contractor certified in certain safety procedures was required. The trucks were also specially prepared to transport these materials. They were lined and a cover was put on them.
John Ellerbee	Why are we concerned with the lead at Sapp Battery if lead is a naturally occurring element?
Brent Hartsfield	We did evaluate what levels of lead and other metals are naturally occurring, that was part of the risk assessment. You do find lead occurring naturally in soils at levels of about 10-15ppm, but at the site we are finding thousands of ppm's. When it gets that much above background, or what's naturally occurring, then you do have a health problem.
John Ellerbee	Who sets standards for the different environmental areas?
Brent Hartsfield	For surface water and groundwater there are federal and state standards. These are based on many studies and tests and have been adopted after pretty rigorous exercise. As far as soils and sediments are concerned, there are no standards. So, we have to look at exposure routes like ingestion by children, and look at what levels would be safe, say in a child's blood. Then, based on that you can make some assumptions on how much a child would eat and then back into how much you can leave in the soil. So you're right, there are no standards for soils and sediments. You get more into a toxicological and health risk assessment. We did have the state health department, a consulting firm and the EPA involved, so the experts were involved in setting those numbers.

John Ellerbee	If you checked the sewage outfall from Marianna, you would probably find more lead than at Sapp Battery.
Brent Hartsfield	They have to meet state discharge standards for lead, and that is regulated as a separate issue.
Margaret Stoneberger	(Suggested that Brent send Mr. Ellerbee a copy of the report. She found it very informative and thought Mr. Ellerbee might understand the problem better after reading it).
Brent Hartsfield	We do have copies of the report, if you'd like to read in more detail about the risk assessment. I'll be glad to provide you with a copy.
Amos Morris	Why did it take 3 or 4 years for you to respond to the problem once it was reported?
Brent Hartsfield	FDER was first aware of the situation in 1977 or 1978. You can't just go out and require the man to do a clean up. There are certain state procedures where you have to first give him an opportunity to continue to run his business and take care of the problem himself and make certain adjustments. We had to go through that and that took a certain amount of time before we could tell he wasn't going to be responsible and take care of the problem. That's part of the reason for the time involved. Once we know he's not going to take care of the problem himself, before you take him to court you have to issue a warning notice and a notice of violation. There are certain procedures you go through, then by the time you go to court, that was another period of time, and you really have to go to court before you force him to close down. There are certain legal requirements before you can actually run him out of business. At times that's a good thing to have so no one is accused of putting someone out of business for no reason. In a situation like this it does hurt you, because it does take time.
Amos Morris	Just for the record, I'm a member of a club in Jackson County and we have been monitoring the Chipola River and Dry Creek from Highway 2 to down below Peacock Ridge.
J. Paul Oxer	Would you care to identify the group?

recycled paper

ecology and environment

Amos Morris

I don't think it's necessary. I can if I need to. We found more lead and cadmium north of Interstate 10, between there and Marianna, than we did anyplace else. The lead and cadmium in Dry Creek has been below the standards for the last five years.

Brent Hartsfield

We have also been testing those areas. HRS, the GFWFC, as well as others have tested there. You're right, when you get 1 or 2 miles from the site, we are finding normal acceptable levels of the metals. We find the high levels on the southwest portion of the sites in Steele City Bay. That is what the proposed clean-up alternatives address. We aren't proposing going into Dry Creek-Little Dry Creek, because at this point, we aren't finding contamination, or high contamination in that area. Testing downstream has shown the levels are high enough to be a health risk.

Amos Morris

If you get in there and start digging don't you think it will agitate it and start things flowing downstream again?

Brent Hartsfield

That is definitely a concern. If we get into removing sediments from the swamps, that is something that will be considered in the design. We may have to temporarily isolate those areas with berms and dikes or employ filter screens to keep the contaminants from moving downstream. Seasonal factors would also be a consideration. We would try not to do this in the rainy season.

Barbara Greadington

Where does the 10% of the cleanup cost not covered by Superfund come from? Will there still be pursuit of Mr. Sapp? If the cleanup begins in mid or late 1987 when will it be complete?

Brent Hartsfield

Superfund, as it is set up now, will cover 90% of the cleanup costs through federal funds. The other 10% is provided by the State. FDER currently has the Water Quality Assurance Trust Fund. This is money that was appropriated by the State legislature for things like this.

The state went to court and was awarded 11 million dollars. We have collected $11,000. When the studies and cleanup are completed we will go back for final cost recovery. At the same time that the state was in court with Mr. Sapp, the IRS was in litigation with him for some tax evasion problems. From what I understand they

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were unable to recover any money either. I'm not sure what the chances of recovering any more money are, but we will try.

The length of the cleanup will depend on what we decide to do. If we go with groundwater recovery and treatment on site, which is in 4 of the alternatives, that's a long term proposition. Most of the construction could be completed in a year. Within the first year we would install the recovery wells, construct the treatment plant and get everything operational. It is estimated in the Feasibility Study from some computer modeling, that to restore the groundwater to State drinking water standards will take about 5 to 6 years. The other cleanup activities, even most of the items addressing soils and sediments, can be completed within the first year.

Panama City Channel 11 Reporter: Who owns the property?

Brent Hartsfield: From what I understand, it's owned by his mother and father-in-law, Mr. and Mrs. Ivey.

Panama City Channel 11 Reporter: So, the state is actually cleaning up someone else's problem?

Brent Hartsfield: When we go back to court for the final recovery, one of the things we do will be to try to force the sale of the property. I'm not sure legally exactly how that would work. When we were in court before, there was a lot of movement of his assets. If he deeded the property to his in-laws before a certain date we may not be able to get it.

Panama City Channel 11 Reporter: Was the $11,000 recovered from confiscated goods?

Brent Hartsfield: Yes. It was from auctioning a truck.

Sandra Rowe: If you treat the groundwater, will it eliminate the problem or will it continue at the same level of contamination? Will we have more or less contamination over the next 5, 10 or even 15 years? Also, will you only treat for lead or will you try to treat for arsenic, copper, nickel and others?

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Brent Hartsfield

It will be a period of years before the groundwater meets state standards. Initially, you may not see that much of a change in the groundwater that is on the boundaries of the property. This is because the majority of the recovery wells will be centered on the site. I'm not sure how it will change over the 5 or 6 years, but at the end of that time it should meet state standards.

Lead is the major concern, because it is more widespread and at higher concentrations relative to the standards. In the risk assessment we considered all the contaminants we were finding in the groundwater. Some of the others above state standards were arsenic, aluminum, antimony, and cadmium. If there were no state standards for a contaminant we referred to other things, like a Federal Health Advisory. After consideration, we set objectives for the 3 or 4 contaminants that were a problem. We will continue to monitor throughout the cleanup and when those 3 or 4 metals are at standards the cleanup will be complete.

Juan Lehman

(States that he is a Jackson County Resident and a member of the Chipola Basin Protective Group).

Based on the comments of your consultant, I assume alternatives 5 and 6 are considered the most likely alternatives. Both the alternatives involve containing the soils on-site. Since this is a geologically unstable area, wouldn't it be better to remove the soils altogether? The major difference in cost will be in the capital cost and Superfund will pay for 90% of it. Why not go with the alternative that would remove the soils to a more geologically stable area?

I would also like to request more time to review reports, in the future? We received this report only one week prior to this meeting.

Brent Hartsfield

When evaluating the alternatives, the geology on-site is a consideration. We have identified some sinkholes. However, these do not cover the whole site. They are mainly located in the area of the west swamp. If we chose one of the alternatives that involved leaving the soils on-site, we would select an area that has a suitable geology . If the whole site was unsuitable, which it doesn't appear to be, then

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that would weigh heavily against on-site containment. We feel that it can be contained on-site. There are some geologically suitable areas of the site.

Juan Lehman — I don't understand why we should consider keeping the soils in this area if there are already approved sites elsewhere and if the Federal government will provide 90% of the funding.

J. Paul Oxer — What Brent says is true. There are areas on site that seem to be properly suited for the type of containment we are considering.

Juan Lehman — If we keep these soils on-site, might it be more likely that we would have a permanent hazardous waste disposal site established in this area?

Brent Hartsfield — There is a difference in cleaning up an existing problem and in setting up a site for receiving waste from other areas. There is a state regulation that prohibits the creation of a hazardous waste landfill specifically for the purpose of receiving hazardous materials from other locations. When you are considering cleaning up soils that are there and are contaminated, that's not specifically prohibited.

The suitability of the site is considered. For example, if we were near the coast and susceptible to flooding, that might weigh against on-site containment. We feel that in this case on-site containment is a viable alternative.

Juan Lehman — I would like to go on the record, for myself and those that I'm familiar with, saying that we want those soils taken to a site that has already been approved for hazardous waste disposal.

Brent Hartsfield — We will add that to the record.

Comment from crowd — We will submit our written comments hopefully by the 8th.

Brent Hartsfield — In response to your request about the reports, there is additional time after the meeting to submit comments. We didn't have that much lead time in distributing the reports.

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Audrey Elofson	I'm with the Chipola Basin Protection Group. Could we ask Dr. Atkerson (HRS) if he has any information on the latest fish testing?
Dr. Atkerson	Since 1983, we (HRS, FDER, and the GFWFC) have been coming here every spring and collecting 50 or 60 fish from several sites along the Chipola River. We have not seen a great deal of difference up and down the Chipola, above or below Dry Creek. Apparently, large amounts of lead were no longer, if ever, getting into the river by the time we began collecting fish. We collected 60 -70 fish this June and we should receive that data from the lab by September 1st.
Audrey Elofson	(Pointed out that the testing actually began in 1982, before HRS was involved. She also stated that the tests were run on the whole fish at first, but the 1985 testing was run just on the filets). Question: I understand that cadmium is showing a decrease, but that lead and mercury are higher. Is this correct?
Dr. Atkerson	There has not been any dramatic increase in lead in the fish. We have been checking for lead, mercury, cadmium, copper and arsenic and some others. We are monitoring over time to see if things are changing. Cadmium does seem to have dropped out of the system.
Audrey Elofson	Copper seems to be lower?
Dr. Atkerson	Copper is primarily a concern because it is toxic to the fish. It is not particularly toxic to humans. Lead and mercury have shown an increase over the 3 years of the study. There are several different ways to interpret that. You never get the same number twice.
Audrey Elofson	My point is that we don't need additional input to the Chipola river from the SAPP battery site. So we would like to see the site cleaned up. I don't think a lot of people here are aware of the effect this has had basin wide and will continue to have until the cleanup is accomplished.
Brent Hartsfield	One of our objectives in the cleanup will be to eliminate that as a continuing source to the surface water system.
Charles Mesing	Have you compared the levels of contaminants to any other systems in the state?

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Dr. Atkerson

Yes, for the four years of the study we chose the Santa Fe River near Gainesville. It is considered one of the most pristine rivers in the state.

Frankly, the levels were comparable in both rivers. In my own mind, I can't ascribe the lead and mercury that we see in the fish in the Chipola River to the SAPP battery site. The distribution within the river does not suggest that and comparison with other water basins does not suggest that.

Jackie Farren Stephenson

If you decide to go with the alternatives that involve capping, what guarantee would I have, as a property owner, that there would not be runoff? I understand there may be contamination on part of my property. What about the other people across south County Road 280? Has that been tested? What will happen to our property values?

Brent Hartsfield

With the alternatives that involve capping, the design would be to prevent run off from going off site. It would also have to be maintained. Continuous monitoring would be required to make sure the cap is not eroding or the material is not leaking out.

J. Paul Oxer

If you recall each one of the alternatives takes into account long-term monitoring and maintenance.

Jackie Farren Stephenson

What about the real estate value of property adjoining the site after the cleanup is complete?

Brent Hartsfield

That will depend on which cleanup is chosen. If you excavate the material and haul it away, the site will have unlimited use and I guess result in better value for the adjoining property. With on-site containment, there would need to be some kind of access limits to the containment area. This would limit the land's use. I'm not sure how this would affect your property values. This is one of the things that will be considered in choosing an alternative.

Concerning soils off site, we have sampled about 15 locations off of the Sapp Battery property itself. We went to all boundaries of the site.

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Acceptable levels of lead were found in all locations except for the spot on your property which is in the southeast corner and adjacent to the Sapp property near the access driveway. The levels we are finding are above the cleanup criteria we've set for soils. They are not as high as some other areas of the site. We feel based on the fact that your property doesn't have a home on it right now or kids that will be on there everyday, that those lead levels are okay until we get to the final cleanup.

Jackie Farren Stephenson — Would it be okay, for cattle, stock and horses at the present time?

Brent Hartsfield — We have presented the data to HRS and asked them to make that determination. When looking at the health effects of the soils we will rely on HRS. We have spoken to them on the phone and there doesn't appear to be any short term problem. HRS will make the final determination and it will be forthcoming.

Larry Williams — How many wells are there on site?

Rick Rudy — 42.

Larry Williams — What is the depth from the land surface to the limerock?

Rick Rudy — That is highly variable. The limestone undulates. It is pockmarked. Depending on where you are it varies from 90 feet to 130 feet.

Larry Williams — What is above 90 feet?

Rick Rudy — That consists of sediments which are fairly impermeable, sandy-clay, clayey-sand.

Larry Williams — What is within 20 feet of the limerock? Clay?

Rick Rudy — That is the weathered zone, the past weathered zone? It is not necessarily clay.

Larry Williams — How thick is the layer of clay between the surface water and the limerock?

Rick Rudy — There is one very thin layer of clay midway down. It is horizontally not continuous, from what we know.

Larry Williams — Doesn't that layer of clay normally stop the surface water from going into the drinking water?

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Rick Rudy	That's not correct. We have data to indicate that by pumping on the Floridan aquifer you draw down those 2 upper aquifers. That data is in the FDER remedial investigation report.
Larry Williams	Does that surface water have a way of getting into the drinking water, fast?
Rick Rudy	Yes, but not fast.
Larry Williams	Would you say that the surface water has a tendency to be purified by the time it gets to the limerock?
Rick Rudy	No, the pH will keep the lead ions in solution. The data shows contamination in the Floridan aquifer.
Larry Williams	You drilled 42 wells. How many showed contamination in the limerock?
Rick Rudy	In the Floridan?
Larry Williams	Right!
Rick Rudy	Two of those 42 are the existing plant wells. There, the deepest one is 190 feet and the other is 130 feet.
Larry Williams	Did they show contamination?
Rick Rudy	They are the most highly contaminated wells on the site. One is at 1800 ug/l and the other is 3680 ug/l.
Larry Williams	You are saying they are above state standards?
Rick Rudy	By far, above the state standards. Then there are 10 or 11 additional wells that are contaminated and probably half of them show several hundred mg/l.
Larry Williams	Above the standards?
Rick Rudy	Yes.
Larry Williams	So, you're saying the Floridan aquifer is contaminated on the site?
Rick Rudy	It is contaminated.
Larry Williams	Above state standards?

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Rick Rudy	Above state standards, which are 50 ug/l.
Larry Williams	You haven't found any wells off the site above state standards?
Rick Rudy	That's correct.
Larry Williams	How many of the 42 wells on-site showed contamination above state standards?
Rick Rudy	I can't say exactly without looking it up, but around the plant facility almost all of them and that's two-thirds of the wells.
Larry Williams	Do you think that hauling the contaminated soil off-site will stop the contamination in the Floridan?
Brent Hartsfield	To add to what Rick said, another factor contributing to the deep contamination is the existence of solution channels or sink holes on site. These allow the surface water to move to the deep aquifer more quickly than if you had a site with regular geology, that is clay layers that would confine the contamination.
Larry Williams	You say you've got contamination in the Florida limerock on the site?
Brent Hartsfield	That is correct, beneath the SAPP property which is 35-40 acres. The majority of our monitoring wells are on those 35 acres. So beneath the site, where all the dumping was occurring, we are finding lead way above state standards in the deep aquifer. When you move away from the site to the residential wells, you don't find any contamination above state standards. The computer models show that contamination is moving from beneath the site to the private wells, but it's not there yet. The model predicts that it will be a few years before it reaches those wells.
Larry Williams	Did you do any studies at the Odum battery site?
Brent Hartsfield	Not as part of this work. This study was to address SAPP battery and it's effects.
Larry Williams	The ODUM facility is a lot closer to the limerock there isn't it?
Brent Hartsfield	I'm not that familiar with that site. If you have specific questions, I can put you in touch with someone at DER who is.

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Judy Carter	Why are we spending the taxpayers dollars to clean up a site that may or may not transfer lead to other parts? All the wells have been tested and none are showing contamination. Why should we clean it up so the Ivey's can come back and use it? Nobody has been contaminated. They've checked everybody's blood in the county. Why are we spending money when we probably won't be able to get it back?
Brent Hartsfield	The property itself is not all that has been affected. The contamination has already impacted off-site areas. There is a small area of soils; it has impacted the swamps and a creek off-site. Also, the groundwater has the potential to move off-site. All that the blood testing shows is that up to this point nobody in the area has an unsafe level of lead in their blood. But, that's not to say that if we didn't do anything, that there isn't the potential for problems in the future.
Judy Carter	Why is this more a risk than jumping in the car and driving down the road?
J. Paul Oxer	When you speak of risk assessment you have to consider the assumption of risk. When we tell you there is a certain risk out here you can assume that risk and live with it. We're not going to force it on you. When you go out on the highway, you choose to assume the risk of potentially putting your life in danger. If we leave this stuff out there it may be an unacceptable risk for those who aren't prepared to assume that.
Audrey Elofson	In 15 years, if you don't clean this up how far do you think the contaminant plume will have moved?
Brent Hartsfield	The modeling has shown that potentially 25-30 wells in the immediate vicinity would be impacted in 10 years.
John Ellerbee	Will iron contaminate you?
Brent Hartsfield	I guess, if it were high enough. If we decided we had an iron problem we would evaluate that i relation to what you find naturally.
Danny Riles	Why hasn't anyone kept tabs on Mr. Sapp since h got out of jail, so you could get some money ou of him?

Brent Hartsfield	The fact that he is out of jail is up to the judge. We took it to court and won the award but we can't really enforce anything beyond that.
Danny Riles	Are you all keeping tabs on the people at United Metals?
Brent Hartsfield	That is being headed up by our district office in Pensacola. After what happened with SAPP, I feel sure it's not going to happen again.
K. O. Stephenson	What will be the final outcome of this meeting? How is the decision going to be made?
Brent Hartsfield	We will be receiving comments through September 8 1986; FDER, EPA and E&E will all look at the comments and questions, evaluate them and come up with what we feel is the best solution for the site. Of course, everything that has been said tonight is part of the consideration.
J. Paul Oxer	It is important that you know that the decision has not been made. Your input tonight is important in the decision making process.

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PUBLIC MEETING

SAPP BATTERY FEASIBILITY STUDY

August 28, 1986

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Sherrin Wheland	P.O. 891 - Marianna Fl.	482-2501
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A.L. Williams	Rt. 2 Box 9 Cottondale Fla	579-4985
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PUBLIC MEETING

SAPP BATTERY FEASIBILITY STUDY

August 28, 1986

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Bob Rousseau	" " " "	" "
Judy Carter	Rt 4 Box 330 Marianna Fla. 32446	579-4643
John Mader	P.O. Box 510 Marianna	526-4500
Janet Sullivan	P.O. Box 301 [illegible]	579-[illegible]
H A Pittman	Rt 4 Box 332 [illegible]	579-4607
Amos H. Morris	Rt 2 Box 96 Cottondale Fl 32431	579-4608
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John Padgett	Rt. 7, Box 643 Marianna 32446	482-2290
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PUBLIC MEETING

SAPP BATTERY FEASIBILITY STUDY

August 28, 1986

NAME	ADDRESS	PHONE NUMBER
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K O Stephens	" " "	" "
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R E Robinson	Altha FLA. 32421-0013	762-3377
E J Elofson	Chipola	
Andrey Elofson	"	
Barbara Greenslade	123 E. Monroe TALL, FL	[illegible]
Donna Hoffman	124 E. Monroe TALL, FL 32304	[illegible]
[illegible]	P.O. Box 65 [illegible]	579-4537
Marion Hendley	Pendleton [illegible]	579-4353
Sylvia [illegible]	Rt 3 Box 48-A Cottondale, FL	594-4595
Bill Dean	Jackson County Health Unit	
Andy Reich	HRS - Tallahassee	
Tom Atkerson	HRS - Tallahassee	

PUBLIC MEETING

SAPP BATTERY FEASIBILITY STUDY

August 28, 1986

NAME	ADDRESS	PHONE NUMBER
Martha Berry	EPA - Atlanta	
Jan Rogers	" "	
Paul Oxer	Ecology + Environment	
Rick Rudy	"	
Gerry Gallagher	"	
Kim Burton	"	
Brent Hartsfield	DER	
Tommy Speights	WTVY - Dothan	
John Ellerbee		
Danny Riles		
Juan Lehman		

September 1, 1986

Brent Hartsfield
Project Management Section
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Re: Sapp Battery Site

Dear Mr. Hartsfield:

We wish to thank you for the excellent and informative Public Hearing on Sapp Battery hazardous waste site on August 28, 1986 at Alford, Florida. You are to be commended on the most professional manner in which you handled the question and answer period at this meeting.

After giving considerable thought to the various options available to purge the site, we feel the removal of all contaminants and hazardous material from the site by truck to an out of state prepared hazardous waste landfill would in the long run be the most economical and permanent solution to the problem. Removal of all the material should reduce monitoring costs to a minimum in coming years. It is, of course, understood that there would be a cleansing of the ground waters in whatever option is chosen by the Department of Environmental Regulation. In view of the fact that this is the most costly of the options, we wondered if you have explored the possibility of an appropriation in several continuing years; assuming, of course, that Congress will appropriate monies annually to the Superfund which will be funding 90% of the costs. With the public becoming more and more aware of the serious and long term effects of contamination, the Superfund will, of necessity, be an ongoing project. A second choice of the options presented would be "soil washing".

There are many people in this area who feel as we do (as evidenced by the large turn out for the testing of blood samples for lead) but who for various reasons will not write to you with regard to this matter. Please consider them also when making your determination.

When you are again in our area, we would be pleased to have you visit us. We are located on C-280, one quarter mile west of the Sapp Battery site at the large white gates on the south side of the highway.

Very truly yours,

Elynore M. Stoneberger
William B. Stoneberger

ELYNORE M. STONEBERGER
WILLIAM B. STONEBERGER

Mailing address:
W. B. Stoneberger
P. O. Box 373
Chipley, Florida 32428
Phone: 5794964

RECEIVED
SEP 3 1986
BUREAU OF
OPERATIONS

2150 Hyde Park Street
Sarasota, Florida 33579
2 September 1986

Mr. Brent Hartsfield
Florida Department of Environmental Regulation
Bureauof Operations
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Mr. Hartsfield:

I wish to thank whoever is responsible for providing me with the information on the Sapp Battery site cleanup.

From the information provided I feel the remedial alternative should be selected by evaluation of public health risk first and environmental impact second. The cost criteria for all appear to be within reason.

I recommend Alternative 2. I would appreciate being informed as to which remedial alternative you select.

Sincerely,

David C. Gould

David C. Gould
Lieutenant Colonel USA Retired

RECEIVED
SEP 5 1986
BUREAU OF
OPERATIONS

Hello

I am a Professional Engineer.

the Consultant who has suggested 16 MILLION to clean up water & soil, apparently has overlooked the "ONE MILLION" it would take to cover the Area with soil to absorb the so-called Poisons.

I have Not seen the Project OR the Area, But I do Know cover soil would absorb and retain for future drying, the alleged poison water.

RECEIVED
SEP 8 1986
BUREAU OF OPERATIONS

Ken Butler, P.E.
200 Patricia Av
Dunedin
Fl 33528

APPENDIX B

CONCURRENCE FROM STATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 24, 1986

Mr. Jack E. Ravan
Regional Administrator
United States Environmental
Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Jack:

The Florida Department of Environmental Regulation agrees with the selection of Alternative #5 as described in the final draft feasibility study for remediation of the Sapp Battery Superfund Site in Jackson County, Florida.

This alternative includes on-site treatment of ground water and surface water, fixation of soils and sediments, and long-term monitoring. This alternative will effectively treat contaminated ground water, surface water, soils and sediments.

The cost estimate for Alternative #5 is $14,319,000 for capital construction costs, $1,997,000 for operation and maintenance of the groundwater recovery and treatment system for an estimated seven years and $27,000 for the first year of site upkeep and water quality monitoring. The state will provide matching funds equal to ten percent of these costs, or about $1,634,300, from the state Water Quality Assurance Trust Fund. The state is committed to perform site upkeep and long-term monitoring upon completion of the remedial activities.

Special Condition No. 20 of our cooperative agreement stipulates that FDER labor costs for the remedial investigation and feasibility study may be applied to the required matching funds.

In addition, the state spent $1,665,898 on a planned removal which significantly reduced the spread of contamination into surface and ground water. These costs should also be applied to the required matching funds. Upon completion of the feasibility study phase, a detailed cost breakdown will be provided with a formal request that these costs apply to our match.

The USEPA has agreed to conduct laboratory tests on contaminated soils and sediments from the Sapp Battery site within the next three months. The tests will determine whether the soil and sediment cleanup goals can be achieved using an EDTA based soil washing technology. If the tests have positive results, USEPA and FDER will consider integrating soil washing into the selected remedy.

The remedial investigation and feasibility study have been successfully completed through a concerted effort by FDER and the USEPA. We look forward to continued cooperation with the USEPA during implementation of the cleanup phase.

Sincerely,

Vicki

Victoria J. Tschinkel
Secretary

VJT/ps